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ABSTRACT

This booklet presents knowledge, attitudes, and educational ideas on how to give deaf children the support they need to develop. It focuses on the fundamental and comprehensive needs of deaf children, using methods and ideas that can be adjusted to countries without great technical resources. The first chapter examines the importance of language acquisition, special education of the deaf, integration and participation, and causes of deafness. A chapter on total communication and sign languages explores features of these communication methods and simultaneous communication. The deaf preschool child and school child are then described, through discussions of early detection, early intervention, communication strategies in the classroom, teaching methods, the use of deaf assistants, similarities and differences between the grades, and the curriculum and materials. Training in vocal skills is addressed through sections on training of residual hearing, teaching of speechreading, and speech training. The booklet concludes with brief descriptions of prevocational and vocational training and the principles of audiology. (Includes nine suggested readings) (JDD)

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Education of deaf children and young people

Centre of Total Communication
Copenhagen, Denmark

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Centre of Total Communication
Copenhagen, Denmark

Unesco, 1987

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PREFACE

This guide is the fourth in the New Series on Guides for Special Education published by Unesco.

The guides, which are intended for teachers, parents and community workers, aim at stimulating discussion on basic knowledge, methods and techniques relevant to the education of handicapped persons, and offer pratical advice for action in this field.

This guide has been developed in response to suggestions put forward to Unesco at the Consultation on Alternative Approaches to the Education of the Deaf (Paris 1984), stressing the need to share information and elaborate training materials.

A manual on Language Curriculum Planning for Deaf Children, to appear at the end of 1987, will complement it.

The views and opinions expressed in this guide are those of the authors and do not necessarily reflect those of Unesco.

Earlier titles in the Series:

1. The Education of Children and Young People who are Mentally Handicapped;
2. Working Together: Guidelines for Partnership between Professionals and Parents of Children and Young People with Disabilities;
3. Testing and Teaching Handicapped Children in Developing Countries.

Future Topics:

- Language and Communication for the Young Disabled Person;
- Education and Training of Children and Young People with Severe Cerebral Palsy (1988);
- Teaching Visually Impaired Pupils in the Ordinary Classroom.

The guides are published in English, French, Spanish, Arabic and Chinese. The text may be freely reproduced or translated provided that mention is made of the author and source.

Special Education Programme

Unesco Paris 1987

CONTENTS

INTRODUCTION 1

1 ATTITUDES TO DEAFNESS 3
- 1.1 The importance of language acquisition 3
- 1.2 Special education of the deaf 5
- 1.3 Integration and participation 6
- 1.4 Definitions of deafness 7
- 1.5 Causes of deafness 8
- 1.6 Organizations and activities for deaf adults 9

2 TOTAL COMMUNICATION AND SIGN LANGUAGES 11
- 2.1 Total communication 11
- 2.2 Sign languages 11
  - 2.2.1 Mime and gestures 13
  - 2.2.2 Non-manual features of sign languages 14
  - 2.2.3 Localization 16
  - 2.2.4 Finger-spelling 18
- 2.3 Sign dictionaries 18
  - 2.3.1 Methods of compiling signs 18
  - 2.3.2 Basic dictionaries and dictionaries of specific subjects 20
  - 2.3.3 Informants 21
  - 2.3.4 Notation of signs 23
- 2.4 Simultaneous communication 25
- 2.4.1 Handalphabets 27
  - 2.4.2 Cued speech 29
  - 2.4.3 Naturally developed combinations of speech and signing 29

3 THE DEAF PRE-SCHOOL CHILD 31
- 3.1 Early detection in collaboration with parents 31
- 3.2 Early intervention and pre-school programmes 31

4 THE DEAF SCHOOL CHILD 35
- 4.1 Acquisition of language and knowledge of the world 35
- 4.2 Knowing a language 36
- 4.3 Different levels 37
- 4.4 When the children start school 38
- 4.5 Contact with the parents 39
- 4.6 Observations during the child's first months at the school 40
- 4.7 Arrangement of the school and the classroom 42
- 4.8 Communication strategies in the classroom 44
- 4.9 Teaching methods and topics 45
  - 4.9.1 Activities that develop language and world knowledge 45
  - 4.9.2 The first subjects 50
  - 4.9.3 Deafness as a topic 52
  - 4.9.4 Written language as seen by deaf children 53
  - 4.9.5 Teaching reading and writing 54
  - 4.9.6 Sex guidance 56
- 4.10 Deaf assistants 57
- 4.11 Similarities and differences between the grades 58
- 4.12 Curriculum and materials 60
- 4.13 The authorities' obligations 61

5 TRAINING VOCAL SKILLS 62
- 5.1 Training residual hearing 62
- 5.2 Teaching speechreading 63
- 5.3 Speech training 66
  - 5.3.1 The speech organs 67
  - 5.3.2 Teaching start and progression 68
  - 5.3.3 Intonation, rhythm, and pitch 71
  - 5.3.4 Training of the teacher's own awareness of articulation 72

6 PREVOCATIONAL AND VOCATIONAL TRAINING 74
- 6.1 Prevocational training in schools 74
- 6.2 Vocational training and guidance in special institutions 75
- 6.3 Vocational guidance in schools for the deaf 75

7 AUDIOLOGY 77
- 7.1 Sound level and hearing loss 77
- 7.2 The auditory system 77
  - 7.2.1 The external ear 78
  - 7.2.2 The middle ear 79
  - 7.2.3 The inner ear and the sensory pathway 79
- 7.3 Medical treatment 79
- 7.4 Early detection 80
  - 7.4.1 The Boel test 80
- 7.5 Individual hearing aids 81
- 7.6 Technical equipment in schools 82

8 SUGGESTED READINGS 84

INTRODUCTION

Deafness itself does not affect a person's intellectual capacity or ability to learn. Yet, deaf children generally require some form of special intervention and schooling in order to gain an adequate education.

Deaf children have unique communication needs: unable to hear the continuous, repeated flow of language interchange around them, they are not automatically exposed to the enormous amounts of language stimulation experienced by hearing children. For deaf children early, consistant, and continuous use of visible communication modes such as a sign language, fingerspelling and cued speech together with amplification and aural/oral training can help reduce the risk of a language delay.

In this booklet we are concerned with presenting knowledge, attitudes, and educational ideas of how to give a deaf child the support he needs to develop.

It is impossible to give pieces of advice which will be suitable to all cultures or countries in the world, and all suggestions should, therefore, be evaluated in relation to the situation in any given society. We have, however, wished to underline the fundamental and comprehensive needs of a deaf child, regardless of where he lives, focusing on methods and ideas which can be adjusted to countries without great technical resources.

This booklet by no means gives a full description of how to work with deaf children and young people, and the use of it must be combined with a proper, qualifying training of educators in early intervention programmes and in schools for the deaf.

Moreover, it is to be recommended that educators form study groups to read the chapters of the booklet and discuss how the ideas and principles conveyed there can be realized in the particular setting of their society.

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1 ATTITUDES TO DEAFNESS

1.1 The importance of language acquisition

A hearing child in a hearing family is surrounded by people who talk with each other. Little by little they also start talking to the baby: they show him things and name them, 'This is a cup'. The baby stretches out his hand, and his parents react by saying, 'Do you want the cup? Here it is'. The baby also uses gestures like waving good-bye and taking his hand to his mouth as if to eat, and again his parents respond, 'Are you hungry? Do you want a banana?', and they give him a banana.

Eventually the baby starts using words like *food* or *eat*, while he stretches out his hand towards the food. He may pronounce the words differently from his parents because some of the sounds are difficult for children to pronounce, but the parents react as if he said, 'I want something to eat', and little by little he learns to combine several words in sentences like 'I want to eat'.

He also learns to talk about things that he cannot see. He asks, 'Where is Mum?', when she is away, and he can be comforted by the answer 'She'll be back in a moment', because he understands what it means to be away for a little while and then come back.

A few deaf children are born into families where all the members are deaf and use a sign language when they communicate with each other. When the baby stretches out his hand towards something, the parents respond by signing POINT CUP, WANT CUP POINT? ('That's a cup. Do you want the cup?'). The child also uses gestures like waving good-bye and taking his hand to his mouth as if to eat, and the parents sign WANT EAT POINT? ('Do you want something to eat?') and give him some food.

Eventually the child starts combining signs and gestures as in EAT POINT ('I want to eat that') and several signs as in MUM GO-AWAY ('Mum has gone away'). When he asks, WHERE MUM WHERE? ('Where is Mum?') and gets the answer COME IN-A-MOMENT ('She'll be back in a moment'), he is reassured. He has been told so before and seen his mother come back after a little while, so he knows what the signed utterance COME IN-A-MOMENT means.

Some of the child's signs do not look exactly like the signs his parents use. He may have problems controlling some of his fingers, but little by little his language comes to look like the language used by his parents.

However, most deaf children are born into hearing families who have no prior experience with deaf people or sign language. A deaf child in a hearing family uses pointing and gestures as the other two children, and his parents respond by saying, 'That's a cup. Do you want the cup?', and they hand the cup to the baby. He takes it and is pleased, but he does not realize that the thing in his hand is called a *cup*. In contrast to the other two children, he does not begin to use words like *cup* or signs like CUP. He keeps pointing at things and using gestures like waving good-bye and taking his hand to his mouth as if to eat, but he does not get beyond this point in his language development. When his mother is gone, he cannot ask where she is - he can only cry, and when he is told that she will be back in a moment, he only sees lip movements that do not mean anything to him.

Eventually his parents may stop talking to him as they see that he does not understand. Perhaps they use a little pointing and gesturing like putting their hand under their cheek to tell him that he must sleep now, but they give up talking to him about what happens around him, what they intend to do, or what he wants himself. Their communication is limited to a few orders about very simple things, and otherwise, they leave the child to himself. He may start at a school for hearing children, and still he does not understand what goes on around him.

A hearing child in a hearing family who uses a vocal language, and a deaf child in a deaf family who uses a sign language, both acquire language and they develop in the same way intellectually, socially, and emotionally. Neither child is handicapped within their families. The only difference is that one child speaks, the other child signs. The deaf child only realizes his handicap when he is confronted with the society of the hearing majority, and his handicap is then a communication handicap: he cannot communicate with hearing people on their terms.

By contrast, the deaf child in the hearing family who do not use any form of visual communication, learns neither to speak nor to sign, and as a result of his linguistic isolation, he may develop severe social, intellectual, and emotional problems. This child does not only have a communication handicap: because his principal caretakers were not told how to overcome the communication barrier, his handicap was multiplied.

1.2 Special Education for the deaf

People who are not themselves handicapped tend to group all children with a handicap together - they do not see a blind child or a speech-retarded child, a deaf child or a mentally retarded child, but simply a handicapped child who is different. If the people who take care of a deaf child are not made aware of the specific consequences of being deaf, and if they do not see the child as a child who is normal except for his lack of hearing, they make him different and abnormal simply by treating him so.

Sometimes educational planners do not consider the specific consequences of different handicaps. They take Special Education to mean Education of the Handicapped with no consideration of the differences between the handicaps. But children with different handicaps have very different educational needs, and each group of handicapped children has more in common with non-handicapped children than with other groups of handicapped children.

A deaf child's main problem is to acquire language when he is surrounded by people who use a language that depends on hearing. A blind child has quite different problems: he can hear the language, but he does not always understand its meaning because he cannot see what it refers to. To plan the same kind of Special Education for these two children just because they are both handicapped is a gross mistake. It is therefore very important to stress that an individual with any kind of handicap has far more in common with non-handicapped people than with an individual with a different handicap. The main problem for a deaf or severely hard-of-hearing child is to acquire a language in which he can communicate freely and which furthers his intellectual, social, and emotional development.

A deaf individual always feels handicapped when he is in a group of hearing people because he cannot hear what is being said and cannot respond quickly and smoothly. When deaf people meet, they always find that they have common experiences because of their handicap, and they generally feel more at ease with other deaf people because they can communicate with them on equal terms. However, most deaf children have hearing parents and siblings, and all deaf people live in societies dominated by hearing people.

Deaf children therefore need to develop a double identity: as members of deaf people's community and as members of the society at large. To make such a development possible, they should be offered contact both with deaf children and deaf adults using a sign language and with hearing people.

Educational planners and teachers should carefully consider what it means not to be able to acquire the language used by hearing people spontaneously, but they should also see deaf children as individuals with all the same potentials for intellectual, physical, social, cultural, and emotional development as other children.

1.3 Integration and participation

The main goal of educating deaf children is to give them the same possibilities of participating in the society in adult life as other people have. Integration is a key word in all work with not only deaf people, but all handicapped people. However, because of the special communicative consequences of deafness, deaf people seriously risk being isolated if they are integrated with hearing people without any contact with other deaf people. On the surface it may look like integration, but a deaf individual has no chance of real participation if he is only surrounded by hearing and speaking people. This situation increases his handicap.

Real participation can only be obtained on deaf people's own terms. That is, they should be offered possibilities of being together with other deaf people, and they should take part in making decisions about their own lives. Only by acquiring self-confidence in this way, will they also be able to participate in the hearing society.

In order to reach this aim, it is necessary to establish pre-school programmes, schools, or sections in schools especially for deaf children. If the society invests in giving special training in deaf education to some teachers, their expertise is used to more advantage if deaf children are gathered in special schools rather than being integrated in normal programmes individually. Consideration should also be given to establishing prevocational and vocational training to meet deaf people's communication needs.

1.4 Definitions of deafness

A prelingually deaf person is an individual who was deaf at birth or who became deaf before he acquired spoken language spontaneously.

A postlingually deaf person is an individual who became deaf after he had acquired spoken language.

No matter whether the hearing impairment is prelingual or postlingual, we are here mainly concerned with children and young people who are functionally deaf, and we use the word *deaf* in this meaning.

A functionally deaf person is an individual whose hearing impairment is so severe that his spoken language development is retarded or absent.

When hearing aids were first invented, teachers in schools for the deaf in countries with adequate resources experienced that the groups of functionally deaf children changed. It turned out that a rather large group of children, who had been functioning as deaf, had a residual hearing of a kind which meant that they could be helped by the use of a hearing aid. In countries lacking these resources, such children are functionally deaf.

Even though their hearing impairments are moderate, some children function as deaf, because they cannot attach meaning to the sounds that they hear. Other children cannot benefit from amplification to such a degree that they can understand normal speech in noisy surroundings. All these children are functionally deaf and need alternative, visual means of communication in order to achieve an optimal development.

Deaf children are sometimes misdiagnosed as mentally retarded, because they do not acquire speech and understanding of spoken language, and the people who make the diagnosis do not see this as a consequence of their deafness. Moreover some deaf children with a poor sense of balance are wrongly diagnosed as having cerebral palsy. It is therefore very important to observe whether the deaf infant or child has normal visual communication and can adapt to normal physical activities, before any diagnosis of additional handicaps is made.

By contrast, there are children with normal hearing who do not spontaneously develop speech. This means that the absence of speech is not always an indication that there is a hearing impairment. These children should not be treated as if they were without hearing.

1.5 Causes of deafness

Most parents want to know why their child is deaf.

The causes of deafness can be categorized as follows:

1. acquired deafness
2. hereditary (genetic) deafness
3. unidentified reasons.

Acquired deafness covers approximately half of the cases, and the causes can be divided into several subgroups:

a. injury at birth
b. infection in the pregnant mother such as rubella or cytomegalovirus infection or toxoplasmosis
c. infection in the child such as meningitis, measles, mumps, or severe infections of the middle ear
d. the use of drugs.

Several antibiotics (e.g. streptomycin, salicylates, chlorocin, neomycin, gentamicin, and quinine) have been found to cause deafness if the mother takes them during pregnancy or if they are given to the infant. These drugs have the same effect no matter whether they are taken by injection or by mouth. They should therefore not be given to pregnant women and small children unless their lives are in danger.

Some cases of *genetic deafness* develop after birth, and a few cases become more severe as the child grows older (progressive deafness). In order to diagnose whether deafness is caused by heredity, it is necessary to examine the family and its health history. Sometimes there is no evidence of deafness in the family, but the cause can be still hereditary. It may then be a recessive inheritance, where the parents have normal hearing, but are carriers of an abnormal gene which may develop deafness in the offspring.

The unidentified causes of deafness cover approximately 25% of all cases - and it should be stressed that causes of deafness are very difficult to determine.

When the parents have just been told that their child is deaf, they are usually too shocked to understand information about the possible causes of their child's deafness. If you suspect that the cause is hereditary, the parents should be given advice and information before planning to have other children. However, in other cases, information should be given little by little at a rate at which the parents can understand and tolerate it.

1.6 Organizations and activities for deaf adults

In most countries deaf adults tend to get together with each other in small informal groups, clubs, and organizations. They do this because they share a common linguistic means of communication, a sign language. This is also a reason why deaf people in many cultures choose to marry each other. Most deaf married couples have normally hearing children, and they live a family life like other people, the only difference being the bilingual situation in which their children grew up.

In many countries deaf people develop their own culture within the culture of the majority. There are obvious reasons for the existence of a deaf culture. Deaf people generally enjoy each other's company because they can communicate freely with each other and because they share the experience of being deaf. In some countries organizations for the deaf include hundreds of local clubs and a national organization, and events such as sports games, stage plays in sign language and mime, and card competitions take place regularly. These activities and organizations would not exist and grow if they did not meet a real need.

The establishment of deaf clubs and regular activities for deaf young people and adults should be encouraged. Deaf people should also be encouraged to participate with formalized responsibilities in the governing of such organizations. Their by-laws should state deaf people's rights and obligations to take part in the governing of the organization.

Deaf clubs should be encouraged to participate in activities for deaf children and in training teachers and parents to communicate in sign language.

It is in such a social structure that deaf individuals gain self-confidence and a productive relationship with others, and it is through these experiences that deaf individuals also get the needed strength to participate in the culture of the majority - the hearing people's culture based on spoken language.

2 TOTAL COMMUNICATION AND SIGN LANGUAGES

2.1 Total communication

Total communication is not a language or any specific means of communication, but an attitude to the deaf child and to communication. People who accept total communication focus on the child's abilities rather than his disabilities, and they use any way of communicating with the child that he can understand. It may be a sign language, it may be a spoken language accompanied by signs, it may be mime and gestures, and it may be drawings.

All people - whether they are deaf or hearing - use pointing and gestures. This is true of adults and children and even infants. If parents and teachers are made aware of the special demands of visual communication, they can develop their use of gestures, pointing and mime to make communication with the deaf child much easier, and they can learn this without much teaching.

Adherence to total communication means acceptance of the deaf child as an individual with the same social and emotional needs as any other child, and it means a constant endeavour to communicate with the child in a way that he can understand.

2.2 Sign languages

As soon as deaf people get together, they start using some form of sign communication, and such communication systems develop into sign languages when they are acquired by deaf children who use them as their main or only means of communication. This means that you can be sure to find local sign languages wherever there are concentrations of deaf people, e.g. in deaf families.

All languages are influenced by the physical and social environment in which they are used. If you live in a society where there are lions and no snow and where your mother's brother is a very important person in your life, then you have words for *lion* and *mother's brother* and not for *snow* in your language. This is also true of sign languages, and it means that the sign language which is best adapted to your society, is a sign language which is already used within the society. You should look for such a sign language and not import a sign language from another society.

Another reason for not importing a foreign sign language, is that this language will be a foreign language to all members of your society, deaf as well as hearing people, but in a phase where you want hearing teachers and parents of deaf children to learn a sign language, it is very bad if there are no native users of the language. In order to learn another language, you need native speakers or signers as models.

The right thing to do in setting up sign language courses for teachers and parents of deaf children, is therefore to start by looking for concentrations of deaf people in towns or deaf families and use these people as informants or, even better, as assistant teachers.

There may be several different sign languages used within your country. Which sign language or sign dialect should be chosen for use within schools for deaf children and in teacher training courses? There is no simple answer to this question, but in order to make the choice, you may consider the following factors.

The character of the sign language is determined by the size and character of the group of people who use it. You should prefer a well established sign language with some tradition used by a large group of people to a newly established sign language used by people with a very loose and temporary organization.

Sign languages are influenced by the spoken languages that are used by hearing people in the same area. Deaf people often use lip movements that imitate individual words while they sign. For example, when they use the sign HUNGRY, they may imitate the lip movements of the word *hungry* of a spoken language. They do not usually use any sounds, only silent lip movements.

In order to choose between several sign languages, you may consider which spoken languages are used in the same area as the sign languages. It is favourable to choose a sign language which is used in the same area as the spoken language which is used for teaching literacy to the deaf children. But you may also consider which language the children's parents speak. Some of the children have probably acquired a little spoken language and some skill in speech reading, and for these children it may be best to choose a sign language used in the area from which they come.

Sign languages resemble each other in certain respects. In the following you will find a description of features that are common to all sign languages, and this will give you an idea of what you may expect to see when you start examining and learning the sign language used in your country.

2.2.1 Mime and gestures

All sign languages take advantage of the fact that they are perceived by the eyes. You will find a large number of signs that imitate gestures like waving good-bye or threatening. Signs for actions and signs for things often imitate the gestures you make when you handle things as, for example, lifting a cup to your mouth (meaning *to drink* or *glass* or *cup*), combing your hair, brushing your teeth, stirring a bowl, hammering, drumming, washing clothes, cutting with a knife. In signs the movement of the hands is shorter and swifter than the actual movements of your hands when you do the actions.

In some signs the handshape imitates the form of a thing, and the hands are moved as that thing typically moves, like the sign for *bird* (which imitates the movements of a bird's beak) or the sign for *butterfly* (which imitates the movements of a butterfly's wings) in some sign languages.

You will also find many signs in which the movement of the hands draws the contours of things like a house or a hut, a bottle, a bowl, an elephant's trunk (as a sign for *elephant*).

Finally, many signs are simply pointing to a specimen of what you want to talk about; you point up to refer to the sky, or you point to your lips to indicate *lips*. Or you point to the sky to indicate the colour *blue*. You also use pointing to address people and talk about yourself and others. A point towards your own body means *I* and a point towards the addressee means *you*.

Once you get the idea of using mime and gestures, you will find it easy to think of ways of communicating with deaf people. How would you, for example, indicate a lion - by forming your hands like paws and look fierce, or by moving your hand over the back of your head as if touching the mane? Both ways may be good. This feature of sign languages - that they include mime and gestures - makes it easier to communicate with deaf people even when you know very few signs.

But you should also note that deaf people in your country may have a standard sign for whatever you want to talk about. They may, for example, only use a sign that describes the lion's mane, and not one that imitates its paws, and then you should use the standard sign.

Sometimes you may feel that a standard sign used by deaf people is a less good depiction of something than a sign that you have thought up yourself. But then you should respect deaf people's signs. None of us likes it when others criticize our language, and even though a sign does not depict its meaning, it may function very well as a sign. Lots of signs do not imitate anything, just as most words in spoken languages do not imitate the things they describe. Nevertheless, we understand each other well if we know the language, and this is also true of sign languages.

2.2.2 Non-manual features of sign languages

When you see deaf people signing, you probably pay most attention to what their hands do, but deaf people do not only use their hands in signing. They also use their bodies and faces.

Movements of the body are used to give rhythm to signing. When we speak, we mark chunks of words - sentences and phrases - by the rhythm of our voices, we change the speed and our tone of voice to indicate boundaries between sentences. Deaf people must indicate such boundaries visually, and they do it by slight movements of their bodies and changes of their facial expression.

The head and facial expressions are also used for other purposes. Negation and confirmation are indicated by movements of the head, and emotions like surprise, anger, joy, and sorrow are shown by means of facial expression. Questions are marked by inquiring looks. Hearing people also use such signals when they talk with each other, but you should be more conscious of your facial expression when you communicate with deaf people.

The mouth may be used to imitate lip movements of individual words in spoken languages, but they are also used to modify signs for actions so as to describe how the action is performed. For example, you may tell that somebody wrote carelessly or easily by using specific lip movements, or you may tighten all the muscles of your face and screw up your eyes to tell that somebody wrote with great difficulty. You use the same manual sign WRITE, but you modify its meaning by means of your lip movements and facial expression.

The eyes are used to indicate to whom you talk and about whom or what you talk. If you want to talk about somebody present, you point towards the person while you look at him, and then you look at the addressee again.

The body, the eyes and the face are also used in a special way when you tell about what somebody did to somebody else or when you reproduce a conversation. If you want to tell that a woman handed a bowl to a child, you may sign WOMAN and point to the right and then CHILD and point to the left. The next sign is BOWL, and then you look down to the left (where the child "is") and imitate the woman's movement of her hands when she handed the bowl to the child (fig. 1).

Sometimes deaf people use both hands to produce two signs simultaneously. You may sign "Are you hungry?" as in fig. 2. Here the signer uses simultaneously his eyes (directed towards the addressee), his face (inquiring looks), his right hand (the sign HUNGRY), and his left hand (pointing towards the addressee).

2.2.3 Localization

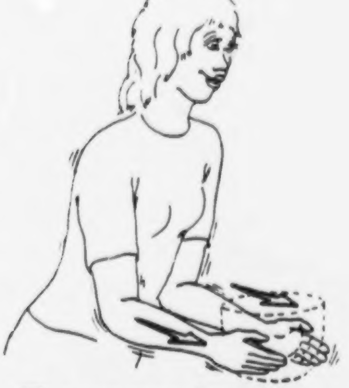
When you tell something in a sign language, you make use of three-dimensional space. You so to speak build up a scene in front of your body. If you want to tell about a woman and her son who lived in houses on either side of a road, you make the sign ROAD from your body outwards, and then the sign for HOUSE first to the left and then to the right, that is, you produce the sign with your hands placed first a little to the left and then a little to the right. Now you have a scene as in fig. 3.

You may want to tell that the woman lived in the house to the left. You do this by signing WOMAN and LIVE and then point to the left. If her son visited her one morning, you tell this by means of the signs MORNING, SON, and WALK. While making the last sign, you move your hand to the left as an imitation of the son's walking to his mother's house.

The sign WALK is often made by holding your hand with the middle and index fingers stretched out and the points of the fingers downwards as if imitating legs, and then you wiggle the two fingers as an imitation of walking. This handshape can be used in lots of ways to describe the way people walk, where they walk, how they walk, and even that they fall or sit down or lie down. All you have to do is imitate the movements people do when they perform these actions; you bend the joints of your middle and index fingers to tell that somebody sat down, and you hold the hand still with the fingers pointing down to tell that somebody was standing somewhere. You may also wish to tell that you had a very bad night, you could not fall asleep and kept turning over in bed. To tell that you kept turning over in bed, you use the same handshape as in WALK, but with the fingers in horizontal position, and you rotate the hand so that alternately the palm side and then the back of the hand is uppermost.

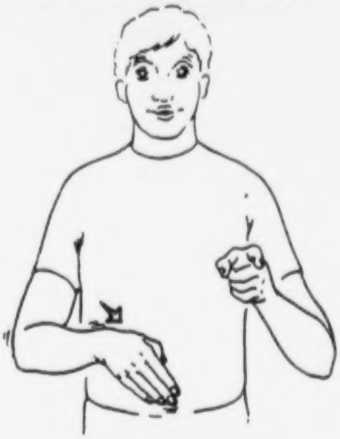
You can only use the handshape with the middle and index fingers stretched out when you talk about people or about animals with two legs like ostriches. You should expect to see deaf people in your country use other handshapes about cars, bicycles, boats, elephants, or whatever they wish to talk about.

Fig. 1.



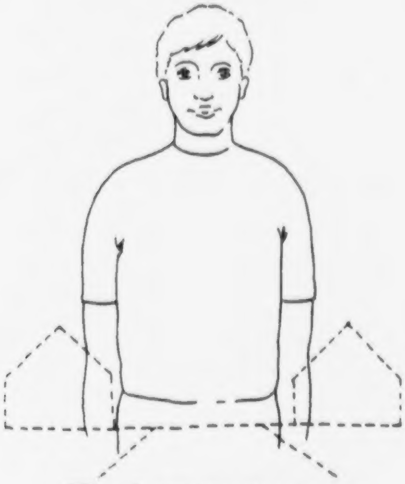
The woman handed the bowl to the child.

Fig. 2.



Are you hungry?

Fig. 3.



The houses were on either side of the road.

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2.2.4 Finger-spelling

Many deaf people use some form of a hand alphabet (see below), and they integrate finger-spelling into signing in two ways. When they do not have a sign for something, but they know a word for it in some spoken language and they expect the addressee to know the word too, they may finger-spell the word. Here they use handshapes for all letters of the words.

But deaf people also use partly finger-spelled words as standard signs. They may, for example, use two letters from the name of a town as a sign for that town, or they may use the first and the last letter of a word for some food-stuff as a sign. Such signs are standard signs; they are made fast and with smooth movements in a way that is well adapted to fast communication. It would be misunderstanding the way language works to insist on an accurate spelling of the words.

2.3 Sign dictionaries

2.3.1 Methods of compiling signs

There are two main methods of compiling signs. The first one is to make a list of words in your own language. Then you ask deaf people, 'What is the sign for ___?', and you get a sign for each word on your list. The second method is to make lists of the signs that you see deaf people use, and then make out what the signs mean.

The advantages of the first way of compiling signs is that it is fast and that you can control the semantic areas within which you get signs. In a reasonably short time you get fairly long lists of signs that you know you need for communicating with deaf people in specific situations.

The disadvantage of this method is that you do not necessarily compile the signs that deaf people actually use when they communicate with each other. The words of two languages never correspond to each other in such a way that for each word in one language there is one and only one word in the other language. This is especially true of words that do not signify concrete things like words for feelings or actions. If you know more than one language, you have probably experienced such differences between the words of the two languages, for example, between colour terms or the terms for members of a family.

There may, for instance, be no sign for *mother* in the sense of 'woman who has given birth to the child' or 'woman who takes care of the child' in the sign language that you examine. When you ask, 'What is the sign for *mother*?', you get a sign which really means 'any adult woman of the family' or 'woman' in general. You may not become aware of this, and then you print the sign with a wrong translation in the dictionary.

By using the second method of compiling signs - that is, by examining deaf people's signing and seeing which signs they use - you have a greater possibility of checking that the signs you compile really are the signs that deaf people use and that they mean what you think they mean. But the second method is very time consuming.

Another problem about the second method is that you never know when the signs you need turn up in conversations between deaf people. For example, you may need signs for things in a school like *blackboard, chalk, book, teacher,* and *pupil,* and you may not have the time to wait for the signs to turn up in conversations. In such a situation you should ask deaf people which signs they use for these things. But this method is only safe when you are looking for signs for very concrete things.

The best way of compiling signs is therefore to combine the two methods. You make lists of words especially for concrete things and ask for signs corresponding to these words, and you also look for signs in conversations between deaf people. When you have compiled a sign by means of the first method, you should always check whether deaf people really use the sign with that meaning among themselves.

It is impossible to follow signed conversations and notate signs at the same time unless you are a very skilled signer. It is therefore very advisable to use deaf assistants in compiling signs.

In compiling signs you will find that there are many signs that do not correspond to any word in the spoken language. They are often signs that express feelings or attitudes in a concise way. Such signs are used very frequently, and if you want hearing people to learn to understand what deaf people sign, they should be included in the dictionary even though they are difficult to translate. You may instead explain their meaning by means of examples.

You will also find that there are some words that have no sign equivalents. This is especially true within technical and specialized subjects. All living languages renew their vocabulary constantly - sometimes by borrowing from other languages, and sometimes by constructing new words from old ones. Sign languages also have means of renewing the sign vocabularies. For example, deaf people in many countries have invented a sign for a video recorder which imitates the movement of the tape in a stylized way. Another way of making new signs is to finger-spell the word of a spoken language. Such a finger-spelled word is often reduced when it becomes a standard sign (cf. section 2.2.4).

If you cannot find a sign for a word, you should explain its meaning and give examples of its use to deaf people. They will then invent a sign for it. If they go on using the sign for some time, it may change in form as it is adapted to their sign language, and this form should then be included in the dictionary.

Unless you are a very skilled signer, you should be very cautious about inventing a sign yourself. It is likely that no one will ever use it because it is incongruous with other signs of the language.

2.3.2 Basic dictionaries and dictionaries of specific subjects

You should start by making a basic sign dictionary with the most frequent signs and those that are useful for parents, children, teachers, social workers, and health care personnel. The following list suggests subjects from which you should include signs in a basic dictionary:

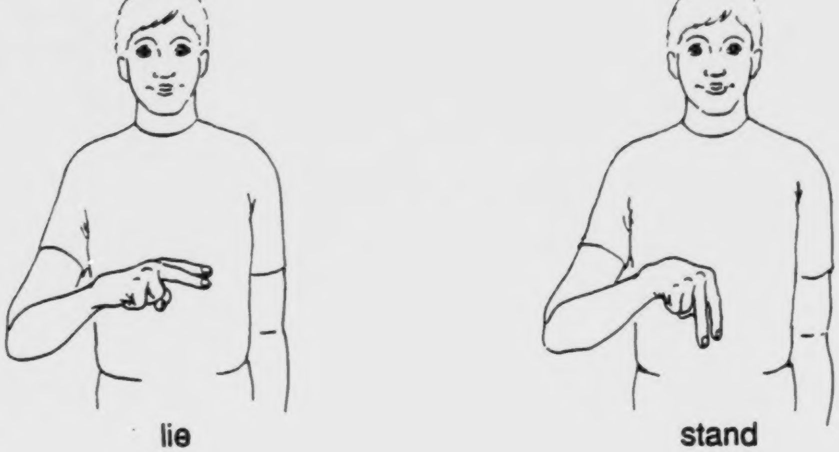
- members of the family
- parts of the body
- food
- clothes
- furniture and household utensils
- things and activities in a school
- bodily functions and sanitation
- time (parts of the day, names of the days in a week, names of seasons of the year, names of festivals, signs for *minute, hour, week, tomorrow*, etc.)
- geographical locations (*town, river*, etc.)
- frequent geographical names
- numbers
- feelings
- colours
- frequent occupations
- frequent actions and states

You should pay attention to handshapes that are used in signs for movement and location like *run, walk, stand*, and *lie* (cf. section 2.2.3). Each sign language has a small inventory of such handshapes which are used about how people,animals, and things move or are situated. Once you have found these handshapes, you can tell a lot by moving them around and placing them above, behind, or next to each other. You may reserve a section of the dictionary for a list of these handshapes with information about what each of them can be used for, and a description with some examples of how they are used as in the example of a handshape from Danish Sign Language, the V-hand, which may be used of people and animals with two legs (fig. 4). (See also *The Thai Sign Dictionary* in Suggested Readings on page 84.)

Once you have made a basic dictionary, you may enlarge it with dictionaries of specific subjects, e.g. subjects that are relevant to teaching like mathematics, health care, family planning, geography, local handicraft, mechanics, and religion.

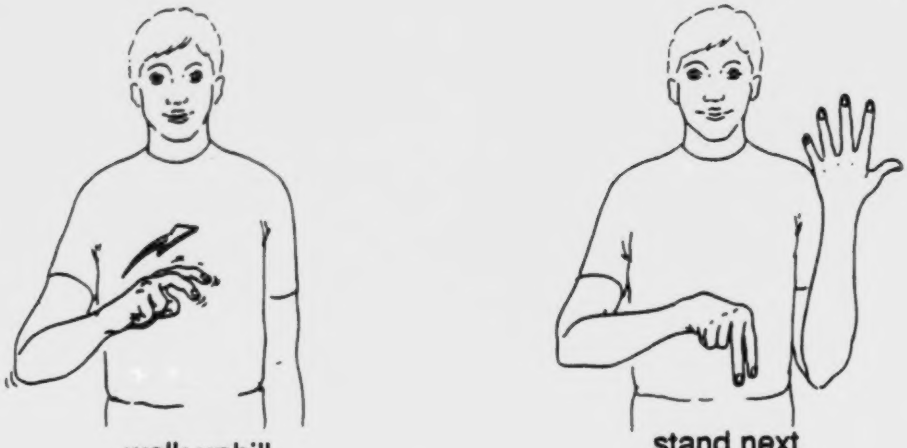
2.3.3 Informants

As informants you should use people who use the sign language regularly, and not always some mixture of speech and signing. It is helpful to start by working with someone who knows both a spoken language and the sign language, for example, a hearing person with close contact with deaf people, but you



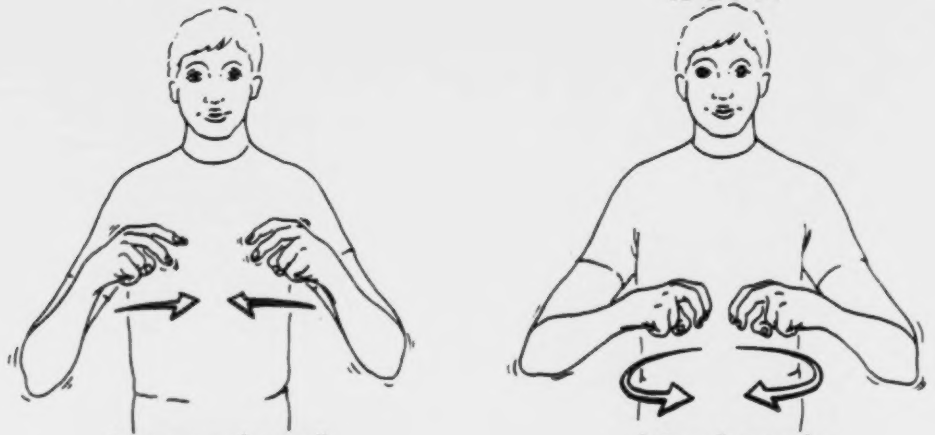
lie

stand



walk uphill

stand next
to a tree



two people walk
towards each other

lots of people
sit in a circle

Fig. 4.

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should always check the signs with several people, and you should expect to see variation in the signs used by different people. Old people and young people, or men and women, or people living in different districts may use different signs. This is seen in all languages and should be accepted.

If you are interested in signs within a special subject like mechanics or handicraft, you should look for deaf specialists within these areas. It may be a good idea to ask them to explain their work to another deaf person, and then pay attention to the signs they use.

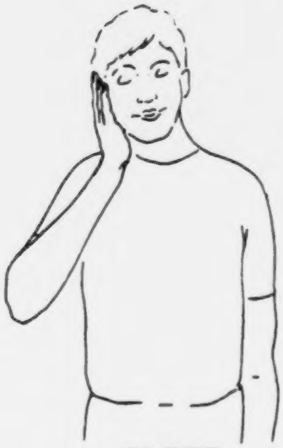
If you ask deaf people for signs, you may experience that they do not understand what you mean, or that they give you any answer that they think you want. The reason is that they are not used to talking with hearing people about their language. They are used to seeing hearing people as authorities who always know better, and they may think that if they give you the answer that they think you expect, you will be pleased with them. It is your task to convince them that you are genuinely interested in their language as they use it.

Deaf people often spend much time discussing signs between themselves, so the best way of compiling signs is to work with deaf assistants who are trained to pay attention to signs and make notes of them.

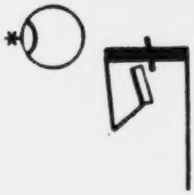
2.3.4 Notation of signs

There is no simple way to write down signs. When you compile signs, it is to be recommended that you use a video recorder because it gives you the possibility of seeing how the signs are used in longer sequences with the rhythm and the facial expressions that are part of sign languages. If you do not have access to video equipment, you may instead take photos or draw pictures of the signs, but then you should make notes of the mouth movements and facial expression that accompany them.

There is a system of sign notation called Sign Writing which consists of stylized drawings (Sign Writing is a registered trademark belonging to The Movement Shorthand Society, Inc., see page 84). In fig. 5 you see a drawing and the Sign Writing notation of the sign SLEEP in Danish Sign Language.



SLEEP

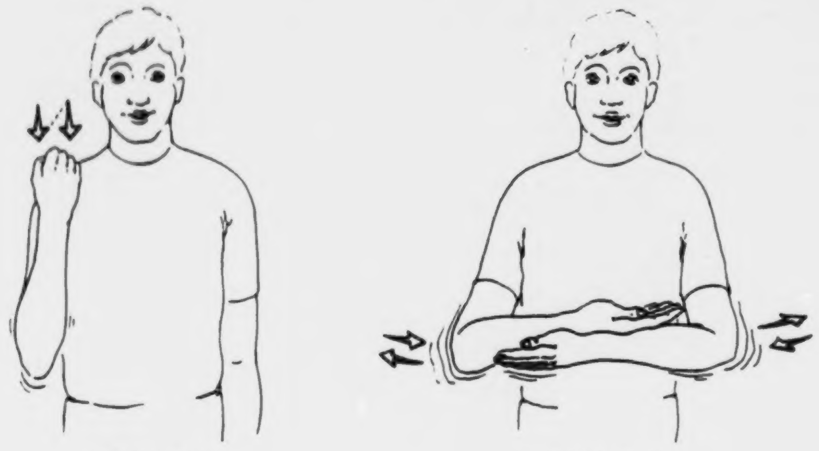


SLEEP notated in the Sutton Sign Writing ®

Fig. 5.

In the dictionaries you should use numbered drawings or photos accompanied by translations into the spoken language. At the beginning of the dictionary you make a list of all the words used in the translations with a reference to the number(s) of the equivalent sign(s). You will find that there may be references to several signs from one word, for example, several signs corresponding to the word *child*; in fig. 6 you see two signs for *child* in Danish Sign Language. There may also be several words that refer to the same sign as *country* and *ground*; in fig. 7 you see the sign in Danish Sign Language which means both *country* and *ground*. This is quite normal in a dictionary that translates between two languages.

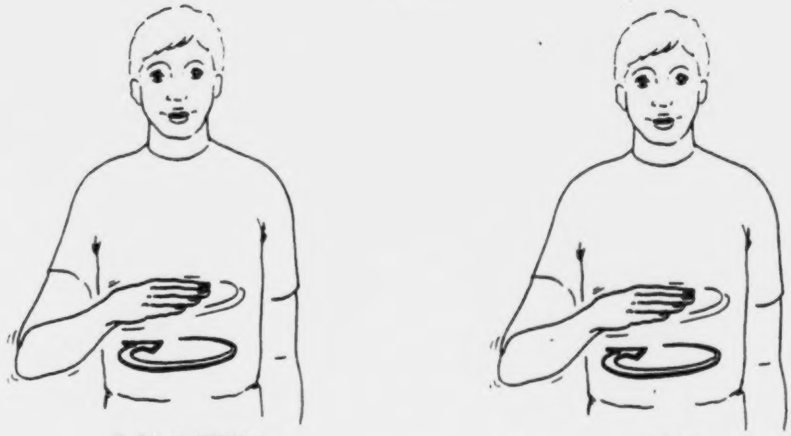
With each sign you should give information about the mouth movement and facial expression used with the sign, and information about variations in the use of the sign, for example whether the sign can be localized (cf. section 2.2.3). Moreover, you may tell whether the sign is only used in certain parts of the country or by certain age groups. In some sign dictionaries there are examples of phrases that illustrate the use of the sign. Such examples are very illuminating, but they are also very time consuming to compile and notate.



CHILD I

CHILD II

Fig. 6.



COUNTRY

LAND

Fig. 7.

2.4 Simultaneous communication

In all countries hearing and deaf people use various mixtures of spoken and signed language besides a sign language as used by deaf people among themselves. Hearing people can learn to use a sign language proper, but for two reasons they often use speech accompanied by signs.

The first reason is that such a means of communication is easier for hearing people and more convenient when there are several hearing people present as in a hearing family with one or two deaf children. In such a situation most hearing people find it unnatural to stop using their voices. Moreover, many hearing impaired children who do not acquire a spoken language just from listening to others, nevertheless do have enough residual hearing to be able to benefit from hearing their parents' or teachers' voices.

The second reason for combining speech and signs is that some people think that even profoundly deaf children learn the spoken language by seeing it "signed". That is, these people accompany their words with signs so as to visualize the spoken language. All sign languages are very different from spoken languages, so a child that only learns a sign language knows nothing of the spoken language used around him. Some people think that they can transfer knowledge about the spoken language to the child by visualizing it. To do this they must invent a special sign code with signs for all words and for the inflections of the spoken language. Many of these signs are not part of the sign language that deaf people use among themselves, they are only used by hearing people.

Experiences from the use of such invented sign codes show that you cannot teach deaf children a spoken language in this way. It turns out that it is impossible to use the sign codes consistently. Even very skilled teachers leave out many signs that are essential to illustrating the words or inflections of the spoken language. The reason for this is that if you want to illustrate all the meaningful parts of spoken language with a sign, your rate of speaking becomes so slow that the message falls apart. In order to speak at a normal rate the teacher has to leave out some signs, but if he does not use the sign code consistently, he cannot hope to transfer knowledge about the spoken language to the child.

In spoken languages we indicate which words belong together in larger meaningful groups by various means. One very important means is intonation. But if you use a code where you combine speech and signs, there is no cue to the intonation, and this makes it very hard, and very often impossible, for deaf children to group the signs meaningfully. All they see is a long list of signs where they can only guess at the meaningful relations.

In sign languages rhythm and 'intonation' is expressed by body movements and facial expressions. This is one of the ways in which sign languages - in contrast to spoken languages - are adapted to perception through the eyes.

There is therefore no reason to believe that profoundly deaf children can acquire a spoken language from seeing an invented sign code that 'visualizes' speech.

However, there are some means of rendering speech and single words visually that may be helpful in the education of deaf children, namely handalphabets and cued speech. Moreover, there are some naturally developed combinations of speech and signing that deaf children can understand and that hearing people may find it convenient to use in some situations.

2.4.1 Handalphabets

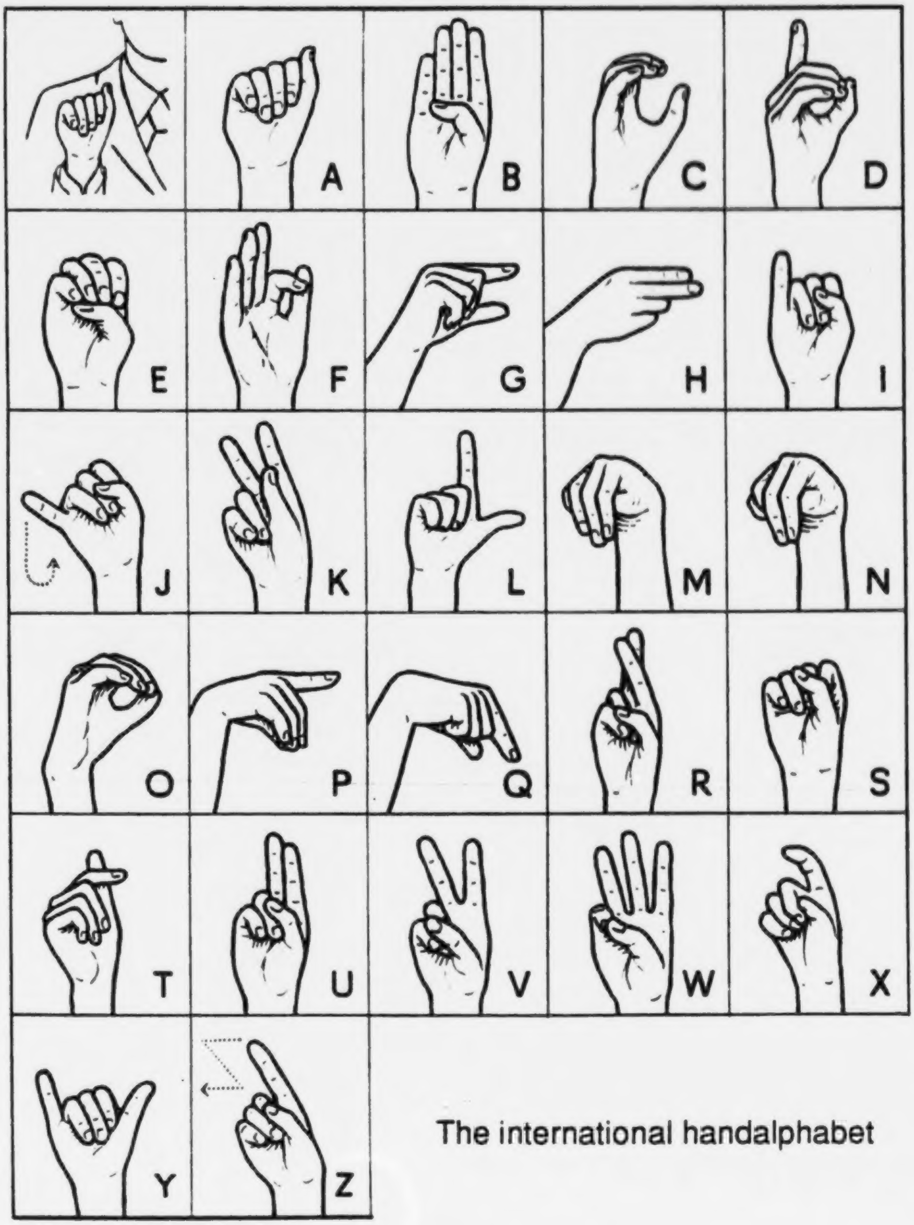
Handalphabets consist of a number of handshapes, each having the value of a letter in a written alphabet. By means of a handalphabet you can convey the spelling of words visually in a sort of 'writing in the air'.

There is a number of handalphabets in use over the world. Some of them make use of both hands, but most of them are made with only one hand. It is generally believed that handalphabets made with one hand held at shoulder level are most efficient as they permit perception of the hand and the mouth at the same time.

The international handalphabet (see fig. 8) has 26 handshapes corresponding to the letters of the Roman alphabet. Many languages are either written by means of other alphabets or scripts or they include supplementary letters. If this is true of the written language taught to deaf children in your country, you should find out if there already exists a handalphabet that covers the alphabet used for this language, or if you have to adapt handshapes from a number of handalphabets to the alphabet used for the written language.

There are a few examples of finger-spelling used with fluent speech. Like the invented sign codes described in the preceding paragraph they are supposed to transfer knowledge of the spoken language to the children, but they are also very slow and impossible to understand for most profoundly deaf children.

In order to avoid confusion, decisions concerning which handalphabet to use should always be taken at a national or preferably regional level.


A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
R
S
T
U
V
W
X
Y
Z

The international handalphabet

Fig. 8.

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Corrigendum

The following text replaces the one on page 29:

2.4.2. Cued Speech

Cued Speech is a system designed to produce a completely clear visual image of spoken language. It utilizes the informations available for lip-reading, and complements these by a limited set of handshapes. These handshapes, the cues, are produced near the speaker's mouth so as the deaf addressee can see the mouth movements with the cues. Thus, in contrast to finger spelling, cued speech visualizes speech, not writing.
The handshape relates to consonants, its location relative to the mouth concerns vowels, so that a given handshape at a given location can clarify a whole consonant-vowel syllabe. This facilitates the production of cued speech at a normal speech rate and rhythm, which can indeed be achieved by most people.

Cued speech can be utilized from the beginning of deaf children's education, either alone or in combination with signs. It has been observed that deaf children who benefit from this system at an early age can develop their reception of spoken language at a rate and to an extent closely approximating that of normally hearing children. To be fully efficient, cued speech should be utilized consistently by the parents whenever they speak to their child. In such conditions, it can be a powerful tool for language development.

Cued speech by itself is not designed as a speech production method, and does not allow very young deaf children to express themselves adequately. It is for this reason that several educators have chosen to combine sign and cued speech in early education, resulting in a special type of total communication. Along with this, and even more so if cued speech is utilized alone, the need remains for developping expressive oral skills through appropriate speech and hearing training methods.

When a child has become acquainted with the system, it can be utilized in the whole education process, either in schools for the deaf by the teachers, or in ordinary schools where deaf children can be mainstreamed with a cued speech interpretor.

The time required to become a proficient cuer varies from person to person. Most professionals and parents can learn the system within a few weeks, but then need a few or many months before becoming fluent.

There are some other systems that visualize speech like cued speech. but none has until now been utilized as extensively and in numerous countries. While it is predominantly utilized in the education of deaf children, it also a valuable help for adults who have become deaf, when their close relatives consent to utilize it consistently.

There are some other systems that visualize speech like cued speech, but none has until now been utilized as extensively and in numerous countries. White it is predominantly utilized in the education of deaf children, it is also a valuable help for adults who have become deaf, when their close relatives consent to utilize it consistently.

2.4.3 Naturally developed combinations of speech and signing

When several hearing people are together with deaf people, the hearing people may find it convenient to use their voices. Hearing people who are very skilled signers like some hearing children of deaf parents, have developed combinations of speech and signing that are intelligible to deaf people. They can combine speech and signing in such a way that the message is transferred visually even though they do not use sign language proper.

However, they do use a number of features from a sign language. For example, they use localized signs (see section 2.2.3) and not just signs in the form in which they are presented in the dictionary. They also use facial expressions that indicate questions, negation, surprise, fear, joy, etc. And they indicate the rhythm by means of body movements. Moreover, they adapt their spoken language to the structure of sign language.

Once you have become skilled in signing without using your voice, you may try to use your voice while signing. But you should always remember that what seems a clear message to you, is not necessarily clear to someone who cannot hear. So you should always pay attention to what your signing looks like when you use your voice at the same time.

3 THE DEAF PRE-SCHOOL CHILD

3.1 Early detection in collaboration with parents

Early detection, diagnosis, and treatment are important to give the deaf child optimal conditions for development.

When a child does not respond to loud noises and there is a failure of speech development, one is likely to conclude that something is wrong. But most deaf infants are almost as alert and responsive to their families as normally hearing children, using their visual sense and their senses of feeling and touching to compensate for their lack of hearing. This means that the parents do not discover the hearing problem. Even when professionals test deaf babies, they may not see that the child is deaf, because he uses his other senses and produces behavioural responses to noise similar to the behaviour of hearing children.

Difficulties in discovering and testing the hearing ability in infants and children may be the main reasons for a delayed detection of a severe hearing loss. Even in countries where early detection and treatment are well organized, deafness is sometimes not discovered until the child's third or fourth year of age.

It is difficult to live with a deaf child day by day, knowing that something is wrong, but not knowing what the implications are or what to do about it. Diagnosis without treatment is cruel, so facilities for early detection and diagnosis should always be accompanied by facilities for parent guidance with positive demonstrations of what parents can do for their child. Every effort should be made to reduce the period between detection and confirmation of irreversible hearing loss and the initiation of an appropriate intervention programme.

3.2 Early intervention and pre-school programmes

By early intervention and pre-school programmes we mean programmes for children prior to their entrance in school, that is, children approximately below the age of 6.

For the deaf children the programmes should provide:

- possibilities for social, intellectual, and linguistic development based mainly on visual communication
- social contact with other deaf children and deaf adults
- auditory testing and training.

Moreover, the programmes should include advice to the parents concerning:

- information on how to meet the child's basic needs for visual and emotional contact through seeing what goes on around him; he should not be left alone
- information on all possible means of communication with their children: natural gestures, sounds, plays, words spoken near the child's ear, a sign language, cued speech, and finger-spelling
- information on hearing aids: fitting, maintenance, and training in use
- meeting other parents through parents' associations, etc.

More than 90% of all deaf children are born into hearing families with no previous knowledge of deafness. Parents will always remember what they are first told about their child's deafness. It is therefore important that the teachers in the intervention programme be made sensitive to the special needs and abilities of each family. They should avoid a standard approach to giving advice to parents. Moreover, they should always look at the potentials of each family and stress a positive attitude to the child's development.

Parents usually ask, 'Will my child talk?'. Since it is always difficult to tell how a deaf child will develop spoken language, teachers in the intervention programme should always be cautious about giving a definite answer to this question, and they should instead focus on what can be done in the immediate future.

Parents should be informed that their child can develop normally in all areas except spoken language communication. They should be told what they can do to respond to their child's modified communication abilities. The child can learn to communicate, but the means of communication must be adapted to the visual sense. The parents should be informed about the different means of visual communication and of manual aids to spoken language. It is very important that they are offered practical demonstrations of these means so that they are in a position to make a real choice of how to communicate with their child.

Furthermore, they should be encouraged to interact with their child through a natural parent-child relationship. In an attempt to do what they think is best for their child, some parents start teaching their child language and forget to attend to the child's needs for a spontaneous communication. If the parents are not told about the total communication approach and sign language (see Chapter 2), they have severe problems communicating with their child later in life.

Parents should be encouraged to look for other deaf children and for deaf adults in their local community in order to give their child opportunities of making contact with other deaf individuals. Through contact with other families with deaf members, the parents can exchange experiences and get social and emotional support.

To make pre-school programmes as successful as possible, teachers should tell the parents about what happens to their child in the programme. A close connection between the pre-school programme and the deaf child's family is important in order to create a world in which the family's emotional resources are combined with the school's education of the child.

Any pre-school and early intervention programme should be organized around the children's needs making sure that they are not just being supervised, but are stimulated through plays and spontaneous communication by means of sign language and spoken language. At this age deaf children are open to all ways of communicating, including mime and sign language.

If a deaf child has never before been exposed to mime or sign language, he may be passive and withdrawn. After a short time in the programme the new visual means of communication may cause a radical change in his behaviour. He starts to communicate with other children and adults and develops language.

Children benefit from participating in early intervention programmes even if it means that they have to be separated from their parents most of the day or even for weeks at a time. They:

- develop skills to actively master their world
- develop consideration and special attention to others
- learn to cooperate and communicate with other deaf children
- get opportunities of enjoying playing, being told stories, looking at pictures, and dramatizing
- develop physically through dancing and rhythmic activities
- acquire visual language.

As deaf children are generally spread over large areas, they either have to attend boarding schools or the intervention programme should provide transportation between the children's homes and the schools. If a child attends a boarding school, the teacher should visit the parents at least once a year and discuss with them the intervention programme, the child's progress and future, and the parent's opportunities of cooperating with the programme in giving the child the best possibilities of development.

The parents should also be offered transportation to the school and guest rooms so that they can visit the school regularly. During the visits, the parents should be given advice about their child and courses in sign language and other visual means of communication.

4 THE DEAF SCHOOL CHILD

4.1 Acquisition of language and knowledge of the world

As he grows up, a small child learns to speak and understand the language that is spoken by the people around him. But before he starts school, he learns much more than that. He sees people work, eat, sleep, dance, play music, tell stories. He takes part in all these activities, and he hears people talk about what they do and why they do it. He sees people die, children being born, and young people marrying. He sees how these events are celebrated, and again he hears people talk about why they happen.

Little by little the child learns not only a language, but also a way of life, sets of values, and common knowledge about life and death, the change of the seasons, and much more. The acquisition of a language cannot be separated from the acquisition of ways of perceiving what we do and why we do it, how we interact with other people, and the values we attach to our actions and what goes on around us.

A deaf child can see the same things as a hearing child, but if he lives isolated among people who cannot communicate with him, he does not hear how people talk about what happens around them and why they do what they do. When such a child comes to the school for the deaf, he has no language, but, just as importantly, he does not have the knowledge about what goes on around him that we normally expect a child to have acquired in infancy. He only knows as much about how to interact with other people as he has been able to infer from looking at others, he knows little about people's motives for acting and he does not share the values that are taken for granted in his society.

It is first and foremost the teacher's task to give the child the knowledge and values that are essential to being a member of his society. In doing this, the teacher should use any means of communication that the child understands and that will give him a tool for analysing and expressing his thoughts, hopes, and fears about his life and the world that he lives in. Acquiring language and acquiring world knowledge go hand in hand. Language learning cannot be separated from the children's increasing knowledge about the world around them from their daily experiences, and in teaching the children about this world in subjects like geography, mathematics, and health care, teachers also teach them language.

The languages that the teachers can use with deaf children are a sign language and a vocal language in its spoken and written form. Unless their families or other people around them have signed to them before they came to the school, deaf children do not know a sign language when they start school. Teachers therefore cannot expect the children to understand them just because they sign. But deaf children can acquire a sign language by seeing people use it. They do not need systematic training in signing.

By contrast, deaf children need systematic training in order to acquire a vocal language. Such training should always be combined with the teaching of the knowledge and the sets of values that we want children to acquire. If the children do not understand what goes on around them, systematic training of a vocal language is useless. The teacher should always make sure that the children understand what she conveys and why they should learn a vocal language.

4.2 Knowing a language

Deaf children who start school cannot be expected to know much of the vocal language that they are going to learn to articulate, speechread, read, and write.

When we know a language, we understand what is conveyed in the language and we can use it to tell others what we want them to know. Some people also learn to read and perhaps compose written texts in the language. These four skills can be presented as follows:

	perception	production
spoken language	understand by hearing	speak meaningfully
written language	read with understanding	compose in writing

Behind all four skills is a knowledge of the language that we do not normally separate from the skills, but we can of course hear a language without understanding it, and we can imitate a sentence that is spoken in a language we do not know. We would not call that speaking the language, as we presuppose understanding in our conception of what it is to speak a language. We cannot speak a language unless we understand what we are saying.

When somebody says, 'My name is __' in a language the child does not understand, a hearing child has one task - he must learn to understand what the sentence means. A deaf child, by contrast, has two tasks. He must learn to see what the other person says by speechreading, and he must learn to understand what the sentence means. The deaf child does not know what a word like *name* means, and he may even not know what a name is, since he may never have heard people use names about each other and about himself.

In the same way a deaf child has to master two tasks before he can say 'My name is   '. He must learn what the sentence means and how it is formulated according to the rules of the vocal language, and he must learn to articulate the sentence. A child who articulates a sentence he does not understand, does not speak the language - he merely imitates hearing people.

Again and again, we must stress how important it is that the child understands what the teacher says and what he is expected to articulate or read or write himself.

4.3 Different levels

Children are not alike, and teachers should always expect them to reach different levels in any skill. Some deaf children may get very far in speaking a vocal language, perhaps because they are good at using their residual hearing. Others find it much harder to learn to articulate the language even with considerable residual hearing. We do not know the reasons for this difference.

We know, however, that there is some correlation between the levels reached in speechreading, reading, and writing. The reason for this correlation is that these skills depend heavily on how well a person knows the language. If you know a language well, it is much easier to speechread.

It is extremely difficult to learn to speechread a language you cannot hear and to articulate this language when you do not get any feedback from your own voice. It may cause deep frustration if teachers spend much time on teaching deaf children a vocal language mainly in its spoken form. We are so used to seeing the skills of speaking and understanding spoken language as prerequisites of reading and writing that we find it hard to understand that it is possible to learn a language merely in its written form. This is possible, however, and as it is so important that deaf children are given a tool to communicate with the hearing people of their society, it is advisable to give priority to the skills of reading and writing in teaching deaf children.

Some children advance faster and become more skilled than other children. Teachers should not force the children who are less advanced, but always make the most of what each child knows to push him a little forward.

4.4 When children start school

When a deaf child starts school, the teacher should make sure that he gets as much information as possible about the child, his family, and his local town or village. To this end it is useful to make out an inquiry form that the teacher can use to interview the child's parents or the person who brings the child to the school. It is preferable that the teacher who is going to have the most contact with the child makes the inquiry, as it is very important that this teacher gets as thorough an impression of the child's life before school as possible. If she does not speak the same language as the child's parents, she should make use of an interpreter, for example another teacher at the school who speaks the language.

An inquiry form for getting information about the child should include questions about the following items:

- the child's name and age
- the child's home town or village
- the members of the child's family, their ages, names, and occupations (if possible, photos of them)
- causes of the child's deafness (When did the child become deaf? Has the child had diseases that may have

caused the deafness? Hereditary deafness in the family? Other deaf members in the family?)
- other diseases or handicaps
- the child's means of communication with the family (signs, spoken language, gestures)
- previous contact with other deaf children and with deaf adults
- the language spoken by other members of the child's family
- the child's tribe or clan
- the child's religion
- rules, taboos, customs of the child's tribe or clan if it differs from the teacher's tribe or clan.

4.5 Contact with the parents

Most parents wish to see their child grow up, but they may feel that once their child joins a school for deaf children and perhaps even goes away to a residential school, others take over responsibility for him. The parents may even hesitate to visit or write to the child for fear of interfering. It is very important that the teacher makes the parents understand that they are still responsible for their child and that they should take an interest in his upbringing. If the child is sent to the school without his parents coming too, the teacher should write to them and ask them to come to the school.

On their first visit to the school, the teacher should show the parents around so that they become acquainted with the place where their child is going to spend so much time. The teacher should also tell them about her plans for teaching the child. All this makes it easier for the parents to communicate with their child and it makes them feel that they are still responsible for him. The teacher should also invite the parents to come to the school as often as possible, and she should encourage them to write to the child regularly and make it possible for the child to go home during school vacations. It is also to be recommended that the teacher write to the parents regularly and tell them what happens at the school.

Many parents believe that their child learns to hear as a result of attending the school. To avoid frustrations, the teacher should gradually inform the parents of what deafness implies and how the child develops. The parents are probably not ready to discuss problems about the child's future when they bring him to the school, but at an appropriate moment the teacher should discuss the parents' expectations about their child's future with them and tell them that deaf adults prefer living with each other to being isolated among hearing people. This may mean that the child will not return to his home town or village when he leaves school.

The teacher may also effect contact between the parents and deaf adults, perhaps members of the staff, as this both gives the parents an opportunity to see how their child may develop and to learn some sign language. Moreover, the teacher may encourage the parents to meet other parents or even form a parent's organization which permits them to discuss problems that they have in common and to put forward suggestions and demands concerning their children.

4.6 Observations during the child's first months at the school

During the child's first months at the school, the teacher should make observations on his health and behaviour.

If the child suffers from infections or other diseases, he cannot be expected to have sufficient energy to benefit from the teaching. The child's sight should be checked, as he may not be able to follow what the teacher communicates unless he is provided with glasses.

The child's ears should also be examined, if possible by means of an otoscope. If the child's ear drums are ruptured, there is a serious risk of infection, and the child should not be allowed to swim and should be warned against putting anything into his ears. His hearing should be evaluated: Can he identify single words? (For ways of evaluating the child's hearing, see section 4.1).

All precautions that are taken as a consequence of the observations on the child's health should be explained to him and to his parents. Here the teacher may find simple line drawings, for example of the ear, helpful.

The teacher should also make observations on the child's way of communicating. Children's level and means of communication may vary considerably. Children from deaf families may be expected to communicate at quite an advanced level of signing, and children whose hearing parents have received guidance about how to communicate with their deaf child may be very attentive to the teacher's communication. But with children who have been isolated in hearing families with no knowledge about the special communicative needs of deaf people, the teacher may find it difficult even to establish eye contact, and without eye contact communication with deaf children is excluded.

To evaluate a child's level and means of communication, the teacher should therefore start by observing if it is difficult to establish eye contact with the child. Moreover, does the child interact with adults or other children on his own initiative, or only when they address him? Does he communicate by means of gestures, pointing, signs, words with or without sound, or merely inarticulate screaming? If the child uses signs, they may be signs that the teacher does not know, either because they have been invented by the child and his family, or because they are only used in the area where the child comes from. The teacher should be very careful not to ignore such signs as they may be a valuable way of making contact with the child. When the teacher makes out what these signs mean, she may gradually show the child the signs that are used at the school instead.

In trying to make out the child's means and level of communication, the teacher may use pictures of people, things, and simple daily situations that the child knows (a child eating, a woman cooking, etc.) and encourage the child to tell what he sees any way he can. But as many children are not used to seeing pictures, the teacher should also make observations of the child in daily life at the school and make notes of them.

Such observations tell the teacher something about the child's previous experience with language and communication and the level at which she can start teaching. However, the teacher should always be very cautious about drawing conclusions about a child's level of functioning. It may take months or even years before she can form a precise opinion about a child's hearing level or means of communication. The child may feel insecure at the school for a long time, and this influences his performance level both in hearing tests and in communication.

Senior pupils may be a great help in making a new child feel comfortable and open to the new surroundings, and it is a good idea to appoint a senior pupil 'brother' or 'sister' of a new child. He should be told about his obligations to the new child and he should be present when the child comes to the school and during the interview with the child's parents. Children always imitate older children in both their behaviour and their language, and you may see that young deaf children learn to sign from their older friends. They may even invent signs that the teacher does not know, but this should not be prevented as it is part of their becoming members of the pupils' community at the school.

4.7 Arrangement of the school and the classroom

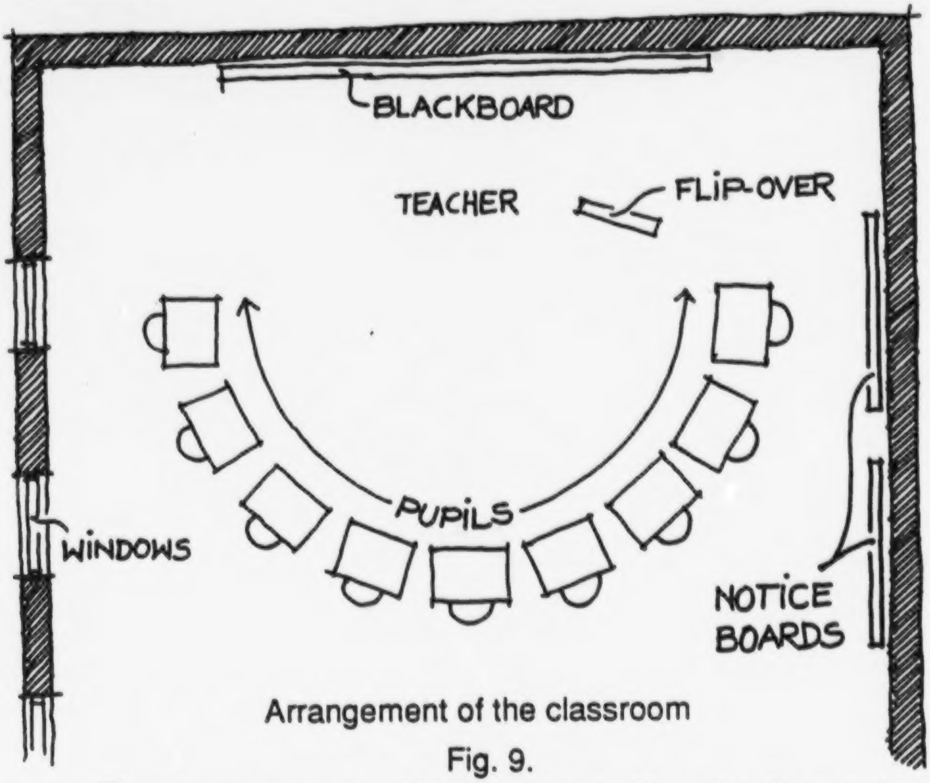
The arrangement of schools for deaf children should be adapted to the children's special needs.

As deaf children are generally less aware of what goes on in the local community and in the world at large, it is useful to put up lots of pictures on the walls. A couple of cameras should be given high piority when the school is provided with technical equipment. A camera permits you to put up single photos of all the pupils and the staff from the headmaster to the janitor with their names written underneath each photo. This is one way of making deaf children understand what it means to have a name. You can also take photos of things that the children see on excursions from the school, and of important events like celebrations at the school. Such photos make it much easier to discuss with the children what they have seen.

Maps of their country, photos from their home towns or villages, and pictures of foreign countries and their people are also useful to enlarge the children's knowledge. Such pictures may not be easy to get hold of, but any pictures' will do - photos from newspapers and magazines and drawings made by the teacher and the pupils.

The classrooms should be arranged in such a way that all the children can see both the teacher and each other, as deaf children can only communicate with others when they have eye contact with them. This means that there should not be more than 10 pupils per class. To facilitate speechreading the teacher should sit at a low chair so that her face is at the same level as the children's faces. Moreover, there should be strong light on both the pupils and the teacher, which makes it preferable that the windows are not behind either the teacher or the children. The best way to arrange the classroom is shown in fig. 9.

When the children work in smaller groups, the tables can be arranged in groups that facilitate communication between the children.



Arrangement of the classroom

Fig. 9.

The classrooms should be provided with notice boards for putting up pictures and texts, and with a blackboard and a flip-over (a sort of easel where you can fasten big sheets of paper with text or pictures). An overhead projector is a great help in showing texts and drawings that the teacher has prepared in advance, but it depends on electricity, and a flip-over may serve the same functions.

With hearing children you can easily tell them something about a picture in their textbooks while each child looks at the picture in his own book, because hearing children can listen to the teacher without looking at her, but deaf children can only understand what the teacher tells them if they look at her. All the children should therefore look at the same text or the same picture so that the teacher can point at words or passages in the text or details of the picture while she explains them. As soon as the children look down in their books, all communication with the teacher stops. A blackboard and a flip-over are therefore even more important in a school for deaf children than in a school for hearing children.

If the school can provide the children with hearing aids, the rooms should be equipped in such a way that noise is absorbed, as a hearing aid in a room with a stone floor and a roof of corrugated iron is worthless. Pictures, drawings, and notice boards of cloth on the walls improve the acoustics of the rooms.

4.8 Communication strategies in the classroom

To accord communication in the classroom the best possible conditions, the teacher should observe the following:

a. There should be strong lighting all over the room.

b. Never speak to the children if they do not look at you.

c. Always speak or sign turned directly towards the children, and not with your back or side towards them (e.g. when writing on the blackboard). When you use spoken language, always speak with a normal rhythm and intonation.

d. Use all kinds of clues to visualize what you are talking about: pointing, drawings, pictures, key-words on the blackboard, dramatizing.

e. Always make the children aware of who is communicating at the moment, also when other children sign or speak. Otherwise the communication turns into a dialogue between the teacher and only one child at a time.

f. Be prepared to repeat comments, questions, and answers from the children so that everyone can benefit from what goes on. Even when an answer is unexpected or different from the answer that you want, you should repeat it if you see that somebody has missed it.

g. Make the children discuss subjects and problems brought up among the children, even if you do not fully understand their sign language. It is of the uttermost importance that they get the opportunity of learning language from each other.

4.9 Teaching methods and topics

4.9.1 Activities that develop language and world knowledge

As deaf children often lack much knowledge and many skills that we expect of children of the same age, the teacher should put much weight on activities that integrate language learning, acquiring practical skills, and acquiring knowledge of the society in which the children live. Especially at the lower level, the children's day should not be split into subjects like mathematics, reading, geography, etc., but these subjects should be integrated in activities like playing, excursions, and story telling. The children may start learning basic arithmetical skills like numbers and simple counting by buying foodstuff at a market or paying the fare in a bus with the teacher's assistance, and they may learn about different occupations from visiting workshops, offices, etc. Botany learnt by seeing how plants are grown is of more use to the children than botany learnt from a book.

During the first months in a new class, the main activities should be various kinds of plays that permit the teacher to make observations on the children's communication and behaviour. Many children are not used to using a pencil or a pair of scissors, playing with things like dolls and toy cars, or looking at pictures. The teacher should initiate plays where she takes on various roles like playing a mother taking care of her baby or selling foodstuff at a market, or a grandfather taking his grandchild to school for the first time. These plays imitate real situations from the children's lives.

In the plays the teacher and the children may use toys (dolls, toy cars, small toy chairs, etc.) and things from daily life (dishes, bags, bottles, etc.). If toys cannot be provided, the teacher should use her imagination to make things out of what is available.

In the beginning the children may not understand what is expected of them. Then the teacher must act several roles and gradually try to draw the children into the plays. She should make clear to them that the plays follow certain rules. For example, you cannot buy something at a market just by taking it, you must pay for it and you must await

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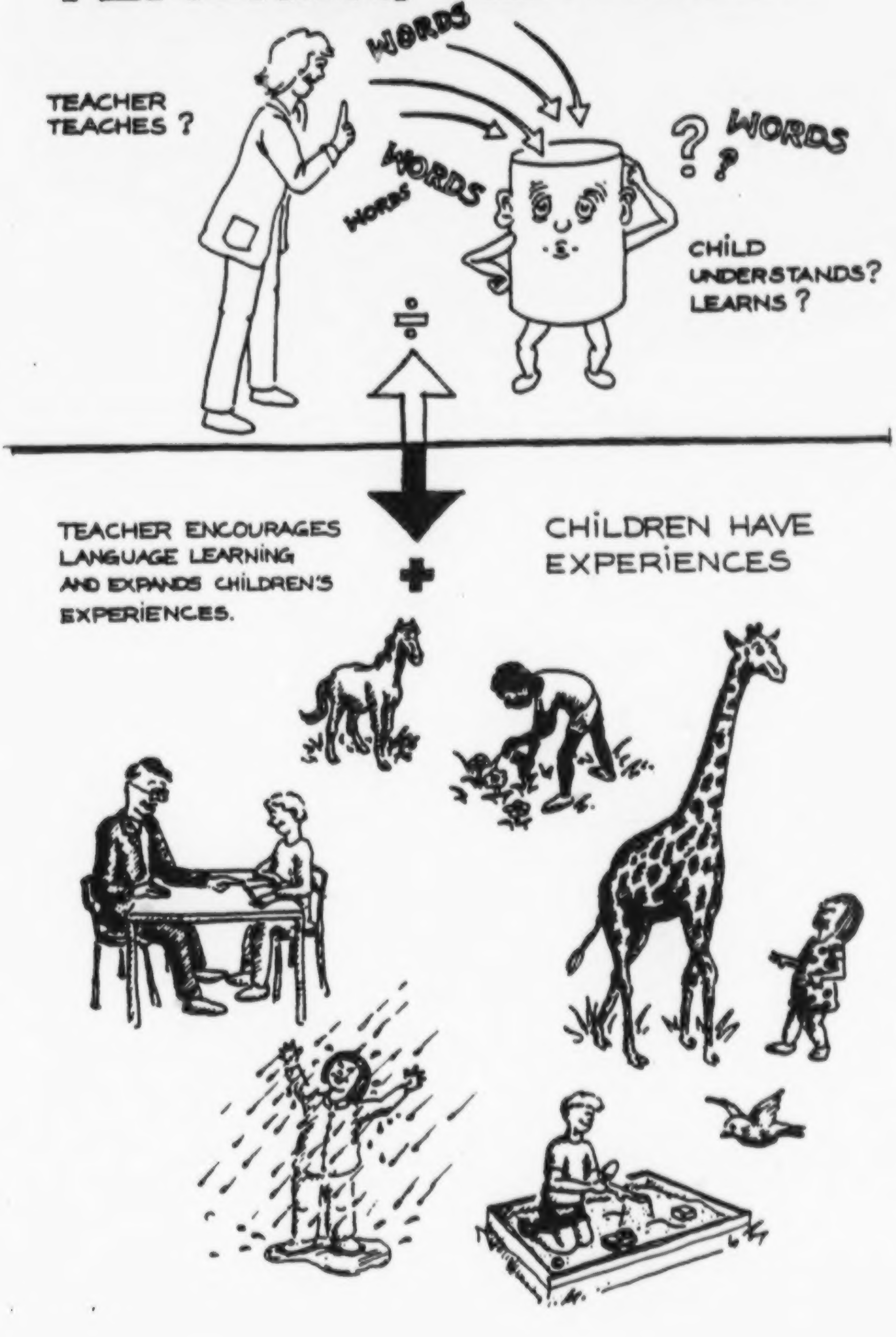
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your turn, and you cannot leave a child (a doll) just anywhere, but should make sure that he is safe. In regulating the play, the teacher should encourage the children to follow certain rules and make them confident in taking part.

It is very important to develop the children's sense of time. This can be done by beginning every day by discussing with the children what they did the day before, what they are going to do that day, and what they will do the following day. To visualize this, the teacher should draw a calendar of the three days as in the diagram on the following page.

The various activities may be illustrated by means of drawings and, in higher grades, described in words. The children should also get a sense of greater spans of time, the days of the week and the months of the year according to the calendar of the culture in which they live. Here the teacher should use two more calendars.

In the calendar of the week you indicate the activities of the current week. In the calendar of the year you fasten pictures and drawings and illustrate festivals and typical activities of each month, and you indicate the current month as well as events of special interest to the children such as vacations. Such calendars should be used through all grades as they make the children more confident about what is happening around them, but you should not spend more than 10-15 minutes per day on this topic.

The teacher should also take the children on excursions outside the school. They may visit markets, construction sites, workshops, farms, etc., take part in festivals and celebrations, or collect insects, plants, shells, or stones. The point is that the children experience as much of the normal life around them as possible. They may integrate these experiences in their plays, enacting situations from the market or the workshop in the classroom.

But the children's experiences from playing and excursions must not be left at that. The teacher should make drawings of things or situations from the plays or the excursions, and she should encourage the children to do the same. Teachers should not let their lack of skill in drawing prevent them from making simple drawings. With a

	yesterday	today	tomorrow
morning			
noon			
afternoon			
evening			

	Monday	Tuesday	Wednesday	Thursday
morning				
noon				
afternoon				
evening				

	Friday	Saturday	Sunday
morning			
noon			
afternoon			
evening			

January	February	March	April	May	June

July	August	September	October	November	December

little training anyone can make simple line drawings of people and the most common things around them.

The teacher should communicate with the children about what they see and explain why people do what they do and why they follow certain rules in their interaction with each other (for example, why dealers at the market claim money for their goods). To this end she may use signs, pantomime, spoken language, and drawings in any combination that makes the children understand her.

It is helpful to have an adult deaf assistant in the class both in play situations and on excursions as a deaf adult may know better how to visualize things and situations in explaining them to the children. If there are not the resources for an assistant, it may be a good idea to unite two classes for some activities like excursions or playing so that there may be two adults with the group.

Stories should be an important part of the teaching through all grades. It is very helpful in developing the children's skills in signing that a deaf adult tells them stories in sign language, but the teacher may also use any means of communication - signing, spoken language, pantomime, and drawings - that makes the children understand.

Even though the children cannot read, they should get used to identifying texts and the functions that writing may have. The teacher should therefore put up pictures with texts from newspapers and magazines. Wrappings from goods and foodstuff with texts written on them may be integrated in the playing. The teacher should not expect the children to read these texts. At appropriate moments she should explain that the texts tell what is inside the wrappings or they describe what you see on the pictures.

The activities during the first period make the children understand what it means to communicate and to take part in rule-governed interaction between people. They also learn the difference between an object and a representation of the object like a toy or a drawing, and they begin to understand why people do what they do. All this is essential to learning language. Moreover, the children learn social behaviour like buying goods at a market and going by bus, and practical skills like using a pencil, a pair of scissors, a needle, etc.

Children who prefer to use their left hand in handling a pencil or a needle, should not be forced to use their right hand as this may hamper them considerably, and they can become as skilled in writing with their left hand as others are in writing with their right hand.

4.9.2 The first subjects

Very early the teacher should make the children understand that they have names. She can do this by drawing the outline of each child on the blackboard, on large sheets of paper or in the sand (demonstrate to the children how they should lie down so that you can draw a line around them). Then she says each child's name, finger-spells it and writes it within the drawing of the child's outline. Some children have name signs which the teacher should add to the vocalizations of their names.

When writing and finger-spelling the children's names, the teacher should not worry about whether the children know each single letter at this early stage. Exposure to writing and finger-spelling is an important first step in understanding what writing is. Little by little the children learn to recognize some whole words and sentences in writing, and not until later should they learn to break the words down into letters.

The period spent on making the children understand what a name is may vary very much from one group of children to another, but it may easily last several weeks. Of course during this period teaching the children their names should be mixed with other activities like excursions, playing, physical training, story telling, etc.

When the children have learnt what a name is, they should learn about the difference between being a boy and a girl. They should realize that some of them are boys and some of them girls, and that some of the teachers are men and some women. Here the teacher may use play situations to demonstrate the different duties and rights of boys and girls and men and women, but she should also make the children understand that some activities are common to both sexes. Both men and women can be teachers, for instance.

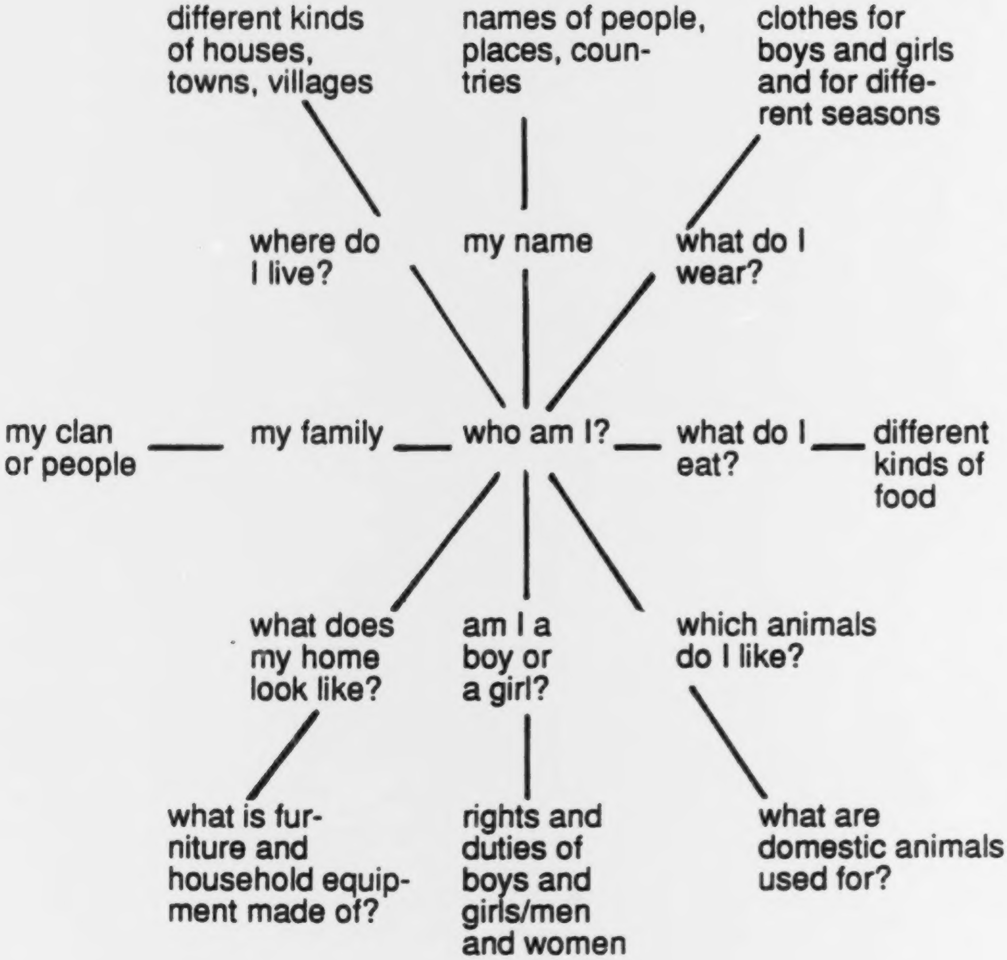
different kinds of houses, towns, villages
names of people, places, countries
clothes for boys and girls and for different seasons
where do I live?
my name
what do I wear?
my clan or people
my family
who am I?
what do I eat?
different kinds of food
what does my home look like?
am I a boy or a girl?
which animals do I like?
what is furniture and household equipment made of?
rights and duties of boys and girls/men and women
what are domestic animals used for?

Diagram of topics that may serve as an inspiration of how to expand from the central topic 'Who am I?'.

Now the teacher adds the sentence '(Name) is a boy' or '(Name) is a girl' to the photos or drawings of the children, and she may also choose to add sentences describing a few typical activities of boys and girls or men and women. In doing so, she should always make sure that the children understand what is meant by the written sentences, and she should be very cautious not to introduce too many new words at a time. To make sure that the children understand the sentence, she should encourage them to make drawings that illustrate their meanings, and ask them to write the sentences underneath the drawings. The children may also dramatize the meaning of the sentences to demonstrate their understanding.

4.9.3 Deafness as a topic

When the children feel confident about being at school and see themselves as members of a group of deaf children, the teacher should begin to make clear to them what deafness is, what sound is, and what the difference between deaf and hearing people is. Hearing people can understand each other even when they have their backs turned. You can demonstrate this by asking a child to hand something of his own choice to you. Then you tell what it is to a hearing person with his back turned. He can then tell what the child handed to you - without magic! But hearing people cannot communicate through a glass window as you can when you sign, and they may find it difficult to communicate in noisy localities. Moreover, they may be greatly bothered by noise (demonstrate that!).

The children should also be told that hearing children learn to speak and understand a vocal language without training when they are quite small, but that they do make mistakes. It may comfort and amuse deaf children to be told some of these mistakes when they themselves have problems learning a vocal language.

It is very important that the children understand the consequences of being deaf - that they will not acquire hearing as they grow up, and that their choice of occupation is limited due to their handicap. In this process deaf adults may be very helpful as they can better explain to the children what it is like to be deaf, and as they can serve as models of adults with whom the children can identify.

Little by little it should also be made clear to the children why it is useful to learn a vocal language. If deaf children go to residential schools and are never taken outside the school, they do not get a realistic view of how one manages to live in a hearing society as a deaf person. The children should therefore be encouraged to interact as much as possible with the surrounding society, for instance by buying things for the school. Such situations demonstrate the need for good skills in the vocal language.

The teacher should discuss these topics with the children when she sees that they are preoccupied with deafness and their future choice of vocational training, but she should also make sure that the topics are part of the curriculum.

4.9.4 Written language as seen by deaf children

Written language is easily accessible to deaf children as opposed to spoken language. But the information in the writing is different for the deaf children than for the hearing teacher. The hearing teacher uses writing as a secondary form of language for which speech is the basis. For the deaf child writing is the primary form, and it may serve as the basis for articulation.

To the hearing teacher the letters represent speech sounds like consonants and vowels, to the deaf child they do not represent anything: they are the silent building blocks of words. To the teacher written words represent spoken words that have meaning, to the deaf child they represent meaning directly once he is told what they mean. A hearing child may have problems with the lack of correspondence between the sounds of a word and its written representation, but the deaf child does not have this kind of spelling problem, he has problems with identifying the correct meaning of a particular word.

A hearing child who is learning to read already knows the grammar of the language and a large part of its vocabulary. A deaf child must be taught the function and meaning of the language's grammar (grammatical markers like inflections, prepositions, or postpositions, and word order) in addition to the meaning of words and phrases. This means that a lot of knowledge that the teacher uses subconsciously when she reads must be explained to deaf children. For example, deaf children cannot know that letters and punctuation marks have quite different functions: letters are parts of words that have meaning, while punctuation marks indicate different kinds of boundaries between sentences and different kinds of sentences. Such a difference is not apparent from the way the letters and the punctuation marks look. Also the children do not know that words are configurations of letters between spaces, and they have to be told how they can use different kinds of markers to recognize for instance the difference between nouns and verbs.

Such aspects of language are more easily explained in connection with comprehension of texts (reading) than in writing them. It is by explaining the content and the means by which it is expressed in interesting and exciting written stories that the teacher can help the children to learn the grammar and the vocabulary of the vocal language. Skills that the children can then practice in production (writing). Reading serves to expand the children's mastery of the language, while writing is the means to make their skill more stable.

4.9.5 Teaching reading and writing

Reading and writing should be integrated with other subjects and activities such as playing, excursions, and story telling. It is important to start with an experience that the children have in common, like a visit to the local mill, as this permits the teacher to make sure that the children understand what she writes on the flip-over or the blackboard.

Stories are another excellent source for reading and writing. All children love to be told stories, and the first purpose of telling a story is to make them experience the thrill and pleasure of a good story. Once the teacher has made sure that the children understand the story, for instance by making them draw various situations from the story, she should write a simple version of the story on the flip-over and go through the text with the children. Here she explains the meaning of words and phrases and points to their representation in writing. In such situations a flip-over is very helpful as it permits the teacher to write the story in advance. She may illustrate it either in advance or while telling it, which gives her a possibility of checking the children's understanding. The use of the flip-over allows the teacher to preserve the story for use in subsequent lessons.

From experiences that the children have in common the teacher may go on to the children's individual experiences. She encourages them to tell about their own experiences in the schoolyard or at home and then she writes what they tell in simple sentences like '(Name) tells: "Yesterday I saw a truck".' But the teacher should encourage the children to tell their experiences in such a way that all the children in the classroom understand them.

When the teacher has written a sentence on the blackboard or the flip-over, she should explain what it means, read it aloud and ask the children to read it aloud and explain in signs, pantomime, or drawings what it means.

When the children have learned to recognize some sentences and words, the teacher can start breaking down the words into letters and make the children see how the letters are repeated in other words and how they are articulated. She should encourage the children to speechread simple words that she articulates, imitate her articulation and write the words by means of the letters that they know. Finger-spelling is very helpful in teaching the children to write.

In order to introduce new words the teacher may make drawings of their meanings on cards and write the words on other cards. When she has explained the meaning of a new word to the children, she encourages them to articulate it and to match the word card with the card with the drawing.

Special material that demonstrates the ideal progression in language training of deaf children is available in very few languages. Adults usually know more or less intuitively how to speak to small children - they use simple sentences and common words. In choosing sentences to present to deaf children, teachers should therefore trust their intuitions about which sentences are simple and which are difficult because of their complexity, and they should expose the children to the sentences in this order.

Once the children get more used to writing, teachers should, however, not hesitate to show them complex sentences that the children cannot construct themselves. They may need some help from the teacher in order to understand such sentences, but we should expect deaf children to become more advanced in reading than in composing.

As deaf children do not know the language of the textbooks and often do not have the same knowledge as hearing children of the same age, textbooks are of little use in the beginning. During the first couple of years the teacher should only use ordinary textbooks as a source of providing illustrations and stories that she can tell the children. Gradually the textbooks may be integrated in the teaching as the children's knowledge of the language and writing increases, but the teacher should go on checking that the children understand what they read. Here she should not hesitate to ask even children in higher grades to make drawings of what they understand.

The teacher should distinguish between two kinds of reading. One is reading for pleasure: the children should be encouraged to make out as much as possible of the content of a text without paying attention to details of the language. The other one is close reading: the teacher explains difficult words, phrases, and sentence constructions.

The same distinction can be made in composition. If the children write something spontaneously, for instance on a drawing, the teacher should not correct errors unless the child asks for the correct spelling of a word. In situations where the children have been asked to write something, the teacher may insist on correctness. However, she should never expect full correctness of deaf children, as it is very difficult to learn to compose in a language that one cannot hear.

4.9.5 Sex guidance

Subjects that are very important at all levels are health care, sanitation, and sex guidance. Many teachers find sex guidance very difficult, both because the children's parents may be opposed to it and because the teachers themselves feel restrained by their own modesty. Many hearing children receive traditional sex guidance according to the culture they belong to, and they often overhear more or less concealed references to sex made by older children and adults.

Deaf children cannot benefit from traditional sex guidance or from occasional references to sex as they do not understand what is being said. Deaf children have a right to be told about this very important side of life and a right to information that permits them to take care of themselves.

4.10 Deaf assistants

Deaf adults who can sign may be of invaluable help in teaching deaf children, as they are usually better at communicating visually with the children than hearing teachers. Often the children respond more easily to a deaf adult, and a deaf adult may find it easier to explain and discuss abstract thoughts, feelings, and delicate topics with the children.

However, deaf adults cannot become assistant teachers without training. A deaf adult who has received very little education may be ignorant about many things, and she may know little about how to teach children. Deaf adults who are accepted as assistants should therefore be offered courses in general educational methods and how to teach deaf children. Such courses should be organized to meet the special needs of deaf adults.

The best way of getting deaf assistants may be to look for groups of deaf people in the towns near the school. Before they are offered the position of assistant teacher, the director of the school should check that they know a sign language and sign regularly. It is less important whether their sign.language is a standard sign language, as they can easily learn another sign language once they can sign.

The teachers should realize that having a deaf assistant puts them under certain obligations. They should let the assistant join in planning the teaching, and they should accept leaving part of the responsibility for the teaching to her. Moreover, they should inform the assistant of what goes on at the school, for instance of decisions made by the director or the board of governors, as deaf adults at times have great difficulties picking up information that hearing people expect everyone to have heard.

4.11 Similarities and differences between the grades

What is common to teaching deaf children in all grades is the continued insistence on and checking of their understanding of the language that is presented to them and that they use themselves. This checking may be done by encouraging them to explain the content in signing and pantomime or by drawings.

Excursions to places outside the school should also be an integrated part of the teaching in all classes. They give the children opportunity to experience the normal life of the society that they live in, and they provide experiences and materials for subjects like geography, mathematics, health care, social science, etc.

At all levels the teacher can take less for granted than in teaching hearing children. Often she must explain feelings, attitudes, beliefs, motives, and morals that she would normally expect children to be acquainted with, but that deaf children miss because they do not hear what adults talk about. This is also why teachers should put much weight on telling the children stories through all grades. Stories and myths are especially helpful for this purpose as they embody common values and ways of perceiving life.

There is always a risk that deaf children never advance beyond communicating about very concrete matters. This is not because they are less intelligent or less interested in what goes on around them than others. Rather the fault is with the hearing people who interact with the children. If these people give up trying to overcome the communication barrier between deaf and hearing people or feel satisfied by communicating with deaf children at a very concrete level, they cannot expect the children to advance beyond this level. It is the teacher's duty to satisfy the children's spontaneous curiosity and wish to understand what is going on around them, and she should do this by communicating with the children in a way that gives them the insights that they want.

Finally, what is common to all levels is that the teacher should expose the children to much authentic written language like newspapers, magazines, and wrappings. Such things should be present in the classroom for the children to look at and play with, even if the teacher cannot expect them to understand details of the texts. She should, however, make sure that they understand the main functions of such texts.

What differs from one level to another is the subjects taught and the language expected from the children and presented to them. The first topics should be what is most near at hand, namely the children themselves, the difference between boys and girls, their different duties and rights, and what it is like to be deaf and to be hearing. The organization of life at the school and in the local community are other very important topics at this stage. From here the teacher may progress to the children's home towns or villages: how is life organized there? Who is in charge in the family and the town or village? Who has which duties in the family? And how do the children's parents make their living? To this end the teacher may use the information provided when the children started school.

Once the children have acquired knowledge about the immediate surroundings and their background, they should learn about their country, and from there the teacher may go on to other countries and cultures that differ completely from what the children know by then. Pictures and films are very helpful in demonstrating different conditions of life and ways of living. Such material may not be easy to get hold of, but teachers should never hesitate to write to schools for deaf children in other countries. Very often such a contact benefits both parties.

In teaching reading and writing, teachers should always start with texts that draw on experiences that the children have in common, and they should follow their intuitions about how one normally speaks to small children and what one would not expect a small child to understand.

The children should be expected to read more complex sentences than they can compose in writing, and they should be exposed to different text types. The first texts should be stories, but it is important that the children gradually become used to seeing and identifying other text types - instructions, dialogues, newspaper articles, letters, etc., and they should learn about the different demands of each text type (letters start and end in special ways, people open certain dialogues by greeting each other, etc.).

At all levels deaf children should receive training in hearing, articulation, and speechreading (cf. Chapter 5).

4.12 Curriculum and materials

The main difference between deaf and hearing children is the way they are taught rather than the subjects they are taught. Teachers should therefore be prepared to follow the ordinary curriculum for hearing children, but with some delay compared with these children and using other methods (cf. section 4.11). Because of their handicap deaf children need some supplementary subjects like what deafness is, what it is like to hear, and what you can accomplish in spite of a hearing handicap. Moreover, deaf children need to be told more explicitly about feelings, motives, attitudes, beliefs, and accepted ways of interacting with other people, and their handicap implies that we cannot expect them to reach the same level in vocal language skills as hearing children. They also need special training in articulation and speechreading and training of their residual hearing.

It can be recommended that teachers make individual plans of how they want to teach a specific class. Here they should make clear to themselves which topics they want to teach and in which order. Moreover, they should make clear how and when they want to expose the children to written language and which constructions and words they want to teach the children. They should also consider how they want to integrate playing and excursions outside the school, and which materials like pictures, films, toys, books, and stories they have at their disposition, and how they should be integrated in the teaching.

Teachers should expect to use textbooks published for use in schools for hearing children with some dealy, and they should find it natural to use other kinds of texts and pictures in the teaching. Old newspapers and magazines, books for children and adults, wrappings from foodstuffs and other products may all fulfil the need for written material that exposes the children to written language and its functions. All kinds of toys, miniature objects, tools, and natural objects like stones, fruits, and plants should be taken into the classroom for playing with and for illustrating the content of texts. In order to give deaf children an impression of the values and beliefs passed on between generations, the teacher should also integrate myths and stories in a form that the deaf children of her class can understand.

4.13 The authorities' obligations

In order to give teachers of deaf children the best possible conditions of teaching, the authorities should see to the following:

1. The general curriculum for hearing children can be used in schools for deaf children, but it should be accepted (a) that deaf children cannot follow this curriculum at the same speed as used with hearing children, (b) that the teachers must use other methods in the teaching of deaf children, and (c) that the children cannot be expected to reach the same level as hearing children within the same amount of time.
2. The special communication needs of deaf children requires that there be no more than 10 pupils per class.
3. Teachers of deaf children should regularly attend courses in a standard sign language and in the methods used for teaching deaf children and the implications of deafness.
4. The schools should be provided with deaf assistants, and these should be offered courses in general educational methods and the special methods used in teaching deaf children, as well as occasional help of an interpreter, for instance at meetings at the school.
5. The schools should have a nurse as a member of the staff.
6. The schools should be equipped with a duplicator, or a film projector, and otoscope, and a couple of cameras.
7. Each classroom should be equipped with notice boards, a blackboard, a flip-over, paper, pencils, crayons, toys, miniature objects, and pictures, besides the usual textbooks.

5 TRAINING VOCAL SKILLS

5.1 Training residual hearing

Hearing losses affect people's hearing in very different ways. Some children can only hear loud sounds, some can only hear high notes, and some only low notes. In training the children's residual hearing, teachers should, therefore, pay attention to both volume and pitch.

In the beginning the main purpose of training a child's residual hearing is to make the child interested in sounds and train his ability to discern sound from silence. To do so you may give the child a ball or a small bag with dried peas and tell him to throw the bag into a bowl in front of him when he hears a sound (demonstrate what you mean by making a hearing person do what you ask the child to do). Then you place yourself behind the child with a drum or two lids and when you make a sound, the child should throw the ball or bag.

Children who are profoundly deaf can get an impression of the difference between sound and silence by touching an instrument like a drum or a guitar when it vibrates and when it is silent. Indicate by pointing to your ears and by an attentive facial expression that you can perceive the sound without touching the instrument. You can also make the child touch your throat so that he feels the vibrations when you speak.

Children who can hear the difference between sound and silence, should go on to learning to discern the difference between different kinds of sounds - a drum, a guitar, a marimba, lids, a bell, a flute, a voice. The child should play with the instruments and try to make them sound before you train his ability to discern the different sounds. Then the child makes drawings of the instruments, and you explain to him that when you make a sound behind his back, he should point to the corresponding drawing. You may instead ask him to turn around and point to the instrument.

The next step is training the child's sense of rhythm. This can be done by making the child touch the skin of a drum while you beat a special rhythm. Then you ask him to imitate the rhythm by clapping his hands. Dancing to the rhythms of a drum is another possibility.

If the child seems to profit from the training, you can go on to different animal sounds and different sounds of your own voice. It is to be recommended that you start by training him to discern different vowels. Children with some residual hearing can be trained to discern different words and sentences that you speak close to their ears.

Training a child's residual hearing is a task that demands much patience from both the teacher and the child, as it may take a very long time before the child learns to discern different sounds. It is very important that the child understands why he should train his hearing and that he enjoys the training sessions. They should be as playful as possible.

If a child is profoundly deaf, hearing training may cause so much frustration that it should be abandoned, but if the child shows signs of being able to discern sound from silence, you should not give up. Very probably he can be trained to make better use of his residual hearing.

5.2 Teaching speechreading

Speechreading means perceiving speech by looking at the person who speaks. The main source of information to speechreading is the movement of the lips, but as you can see from looking at yourself speaking in a mirror, you cannot discern many sounds by the movements of the lips. If you want to find out how difficult it is, try to speak to your family without using your voice and see if they can understand you.

In speechreading you also draw information from other sources: the movements of the cheeks and the chin, the speaker's facial expression, eye movements, body rhythm, and gestures, your knowledge of the situation in which the communication takes place, and your knowledge of the language.

When we speak, our facial expression reflects our emotions. We usually look happy when we tell that we are pleased with something, or angry when we scold people. When we talk about a thing or a person that we can see from where we stand, we look in the direction of this thing or person. Our body moves in a rhythm that corresponds to the phrases in our speech, and our gestures underline boundaries and stressed words. Some people even use gestures that are vey close to signs in a sign language, and in all cultures there are certain standard gestures used by hearing people like movements of the head for affirmation or denial, pointing, greetings, insulting movements of the hands, etc.

Moreover, in speechreading - and in all language understanding - people draw on their knowledge of the situation and of the people who take part in the communication: What can you expect these people to say in this situation?

The final source of information is our knowledge of the language that is spoken. You can appreciate the importance of this knowledge for speechreading by asking someone to remove every sixth word in a text, for instance a newspaper article, and then you read the text. You will experience that you have no or very little difficulty reading the text. The reason is that you fill in the missing parts on the basis of your knowledge of the language and the topic of the text.

Speechreading only on the basis of the movements of the lips would be like trying to make out the meaning of a stream of sounds in an unknown language on a film strip where all you could see of the person speaking was the lips moving. That is impossible!

When you teach speechreading to deaf children, you should make sure that the child can draw on as many of the sources of information as possible. Moreover, it is important that there is strong light on your face and that the child has normal sight or is provided with glasses.

In the beginning you must expect the child to know very little of the language. You should therefore use utterances in natural situations where you refer to things in the immediate context, and you should let your facial expression correspond to the emotional content of your utterances.

In special training sessions you may for instance talk about a drawing a child has made, pointing to things in the drawing, telling what they are and expressing your emotions at seeing them. But you should also use other situations as an opportunity to teach speechreading. The routine activities of the class like greetings in the morning, taking out paper and pencils, and cleaning the blackboard, are ideal for such occasional training once you are sure the children know these routines.

The children should be encouraged to guess at the meaning of your utterances on the basis of the clues they can discern, as good guessing is a fundamental part of understanding language.

You can test their understanding by asking them to do things and see if they do as they are asked, or you can ask them to explain by signs or mime what you said. You can also encourage them to repeat what you say, but you should remember that even though a child can repeat more or less accurately what you say, this is no guarantee that he understands the utterance.

Gradually, as the children's knowledge of the vocal language increases, you may go on to more complex sentences and to speaking of absent things and events. When the children become more advanced in speechreading, they should be encouraged to use their ability in communicating with people outside the school.

All the time you should make sure that the children understand why they receive training in speechreading. If they cannot see the importance of being able to interact with hearing people, they cannot be expected to be prepared to spend much energy on trying to learn to speechread. It is therefore essential that the children become as much aware of life outside the school as possible.

As with training residual hearing and speech, you should expect the children to reach different levels. If a child has some residual hearing, he may be able to make good use of it in speechreading, but it depends very much on the nature of his hearing loss.

5.3 Speech training

Deaf children do not develop the spoken language of their community in the same way as normally hearing children do. Due to their lack of hearing they learn neither to understand the spoken language nor to distinguish the different sounds of which language consists. They cannot reproduce sounds correctly as they do not hear them or only hear some of them, and what they hear may even be distorted. Furthermore they cannot hear their own voice and that is essential to controlling speech.

Depending on the extent of the hearing loss, deaf children may produce some more or less understandable sounds, but they are far behind hearing children in speech development.

For a deaf child it means really hard work and endless struggle to develop speech, and unfortunately the result of years of training does not always meet up with the expectation of the child himself, the parents, and the teacher. Only a small percentage of the children with a great hearing loss achieve intelligible spoken communication skills. Many of them are only able to make themselves understood by their teacher and close family.

All children, hearing as well as deaf, babble, but while hearing children continue to babble until they start forming intelligible sounds and words, the deaf child eventually stops babbling because he does not get any feedback. The hearing child keeps getting feedback from his own voice and from the people around him. All these sounds inspire him to go on experimenting with soundmaking, whereas the deaf child loses interest in producing sound.

If parents have any means of comparison either with older children of their own or children of the same age as their own children, they may notice that the language of their child is delayed. But if they do not have any means of comparison, it may be longer before they realize that something is wrong.

Deaf children should be taught to articulate a spoken language, but they cannot be expected to reach the same level. If a child has been able to hear even for a short period, perhaps less than a year, this greatly influences his possibilities of learning to articulate well. Such a child may reach a level of intelligible speech.

The greater the hearing loss, the more difficult it is for the child to learn to articulate well, but the child's various abilities for learning to articulate should also be considered. Children with apparently identical hearing losses may develop very different articulation skills.

Hearing aids may be of great help to children with some residual hearing. It may influence the rate of acquiring articulation skills as well as the intelligibility of their speach.

In order to articulate well one must be able to control the muscles of the chest (for controlling the airstream), the vocal cords, the muscles of the cheeks, the jaw, the tongue, and the lips. In natural acquisition of speech this control is mastered gradually, but a deaf child who has only used his voice for cries, often has no such control. It is a good idea before starting the actual speechtraining, to check the child's control of his lips and tongue. Excercises for training respiration are mentioned in connection with training lip movements, but apart from that, respiration comes in naturally with the very first vocalization excercises.

5.3.1 The speech organs

The tongue

The tongue is one of the most important organs involved in speech, and with small children games can be made to insure the mobility of the tongue.

1. Let the child lick a lollipop or imitate licking it.
2. Let the child lick dabs of chocolate, honey or syrup placed at the corners of his mouth.
3. Let the child try widening and narrowing his tongue in front of a mirror.

Lip movements

If the child does not speak yet, lip movements may not occur very frequently. Games where the child is asked to imitate the teacher's lip movements give the teacher a clue as to the child's ability to produce the four lip movements which are required in speech: rounding-protusion, spreading, breath retention (closed lips), and repeated closure.

Rounding-protusion: Train the child in forming his lips this way by blowing out a flame, for example, a match, a candle or a small oil-lamp. This exercise can also be extended to a breath-control exercise. Ask the child to blow at the flame without extinguishing it.

Spreading of the lips: Can the child smile? Check by doing or saying something funny or by tickling him. Pretend that you and the child are lions, tigers or another kind of animal showing their teeth and closing their mouths. The child will enjoy it if you draw small pictures of animals to visualize this game.

For combined training of lip and breath control the shape of the mouth is of no importance, but the lips should be closed at the beginning. Sit at a table opposite the child and place a small piece of cottonwool in front of you. Blow it across the table towards the child saying 'pa pa' and ask the child to blow it back again in the same way. More children can join in this game as a kind of competition blowing towards a common goal. Who gets there first? Instead of cottonwool you can use small feathers, bits of paper, popcorn, ping-pong balls, etc. Put a series of five candles (or small oil-lamps) in front of the child and ask him to blow out the candles one by one remembering to close his lips in between each blow.

After having checked the child's control of his lips and tongue, you may proceed to his awareness of the other parts of the cavity of the mouth. To stimulate the child's sensation of the parts within his mouth, the teacher can guide the child's finger into his mouth so that he learns to recognize the different parts: the tongue, the inside of the cheek, the velum, the palate. This should be done very carefully and only if the child wants to cooperate.

5.3.2 Teaching start and progression

In order to stimulate the child to motivate him to learn to articulate, you must plan your programme carefully so that the child can feel success. A separate programme must be set up for each child, as no two children are alike in their speech development. Before starting to articulate with a child, you should spend some time listening to check what speech sounds the child already possesses, so that you know where to begin and can start forming your teaching strategy. You may find that the child can produce certain sounds in some combinations but not in all combinations.

It is important to create a happy relaxed atmosphere around the speech-training sessions. If the child likes animals, small toy animals can inspire sound production. Many children like to imitate a barking dog, a bellowing cow or a mewing cat. You have to try with each child individually to see how you can motivate his speech production most successfully. It is a good idea to start with sounds that the child knows and can feel, such as sounds from cars, trains or aeroplanes. Pictures of these, or even better small toy models, very often inspire the child to produce the sound of an engine. Children love drums, and training babble sounds accompanied by beats on a drum is another way to mobilize the child's active speech production. Drums are also useful to help giving the child the feeling of intonation and rhythm in the language.

While trying to develop the child's vocalization, the teacher must constantly use a natural language when talking to the child. She should not repeat or use the child's incorrect utterances, but by means of natural communication make the child aware of the correct utterances.

If the child does not produce any spontaneous sounds, the teacher should try to provoke an involuntary vocalization. This is best done during games where you can bring forward laughter through tickling, physical play, and slapstick games or through such games as tug-of-war or one-arm wrestling. These games all provoke vocalizations which then should be reinforced. When the child is aware of vocalization and can produce it spontaneously, you can go on playing games with him in order to awaken his interest in what vocalization can be used for. Pretend for example to be asleep and let the child wake you up by producing sound, this game can also be used at a later stage, when you only 'wake up' if the child produces a specially loud or high-pitched sound.

In the beginning, these spontaneous vocalizations may be harsh and brief. This is where speech breathing training comes in. Let the child inhale and then produce a prolonged vowel during the exhalation, practice until the child can sustain the vocalization for at least three seconds. In order to make the child interested in producing this sound, you must visualize his vocalization in different ways. Draw a line on the blackboard starting at one end and see if the child can vocalize long enough to make the line reach a certain point/the other end, walk along a line and measure afterwards how far you walked, move a favourite toy towards the child, pour sand or liquid into a narrow vessel, ready to overflow if the child's vocalization lasts for more than three seconds.

Such games all visualize the sound, but you can also use a touch to sharpen the child's awareness of sounds. Move your hand up along the child's arm from his wrist to his shoulder while he inhales and let your hand move back the same way following the vocalization (as the child lets out the air). Let the child carefully try step by step to prolong the vocalization so that you reach approximately three seconds. It is important that the teacher is imaginative in order to maintain the child's interest.

When the child masters one long vowel, try to let him produce more vowels in one breath, start gradually and go up to five or six in one breath. This can be visualized by holding a feather or a scrap of paper in front of the child's mouth so that he can see the movement caused by the airstream. Hold the child's hand in front of his mouth so that he can feel the airflow on his hand, or use the stroke up his arm as described above.

When starting the actual speech training, it is important to teach the different skills in the right order. If you force the child to produce difficult sounds before he is ready to form them, you waste time and discourage the child and yourself.

First of all the child's vocalization must be established. Then you can start teaching some vowels, which again leads you to introduce the first consonants. In doing so, it is important to pay attention to the fact that as there is much greater sensitivity in the front of the mouth than at the back, speech sounds formed with the lips and the tip of the tongue are much easier for the deaf child to learn than the ones produced towards the back of the mouth. Your teaching programme should therefore be built up to practice consonants in combination with alternately front, central, and back vowels. Consonants do not appear in isolation in the language and they should always be taught in combination with vowels already mastered by the child. Practice the consonants in syllables or words in initial, medial, and final position.

In choosing sounds for training articulation, you should also think of which words are specially useful to the child, or which words appeal to him such as the word for a particularly beloved toy or the name of a beloved person. Even though such a word is hard to articulate according to our knowledge of the speech organs, it may be easier to learn for a particular child because he is highly motivated.

5.3.3 Intonation, rhythm, and pitch

It is very important to get the right intonation of utterances because the meaning of a single word as well as of a whole utterance may depend on this, and misunderstandings may easily occur if the wrong syllable or word is stressed.

To obtain a correct rhythmic speech, it is important from the very beginning in speechtraining to work with the right stress when learning the vowel and consonant combinations.

Control of the vocal pitch is most easily acquired if the child is able to use his residual hearing. For totally deaf children it is a harder job, but it can be mastered. Children with some residual hearing should listen to their teacher when she visualizes the difference between high-pitched and low-pitched voice by holding her hand up high above the head or below the waist. When a child can identify the pitch of the teacher's voice, he should start trying to imitate the teacher.

With a deaf child it is advisable to start teaching him low-pitched sounds first. This can be done by letting the child relax his arms and shoulders and lower his chin towards the chest while vocalizing. When the child is able to produce this low-pitched voice on command, you can go on to change between low and medium pitch which usually can be brought forward with the help of your hand held in different positions. It is important that the children do not get the idea that a 'high' tone equals a 'loud' tone and a 'low' tone equals a 'faint' tone.

5.3.4 Training of the teacher's own awareness of articulation

Place yourself in front of a mirror and observe the movements of your lips, jaws, and chin while you speak. Try to become aware of the different parts of the cavity of the mouth in order to give yourself a good introduction to what actually happens when you speak your mother tongue.

Select words in your own language which contain the sounds 'i' and 'a'. When you say 'i', you can feel the tongue high in the front of your mouth and when you say 'a' the tongue is low towards the back. With your finger you can feel these positions of the tongue. A consonant in front of 'i' or 'a' changes the lipreading pattern.

Look in the mirror and say alternately 'm' - 'p/b' or 'n' - 'd/t', and you will find that you cannot tell 'm' apart from 'p/b' or 'n' apart from 'd/t'. Find words in your own language which start with these sounds and get an awareness of the position of your lips, tongue, etc. Find words in your language with consonants produced hidden in the cavity of the mouth so that nothing is shown at the lips and get an awareness of how these consonants are produced.

On the following page you will see a cross section of the articulatory organs which may help you to locate the places where the different sounds are produced.

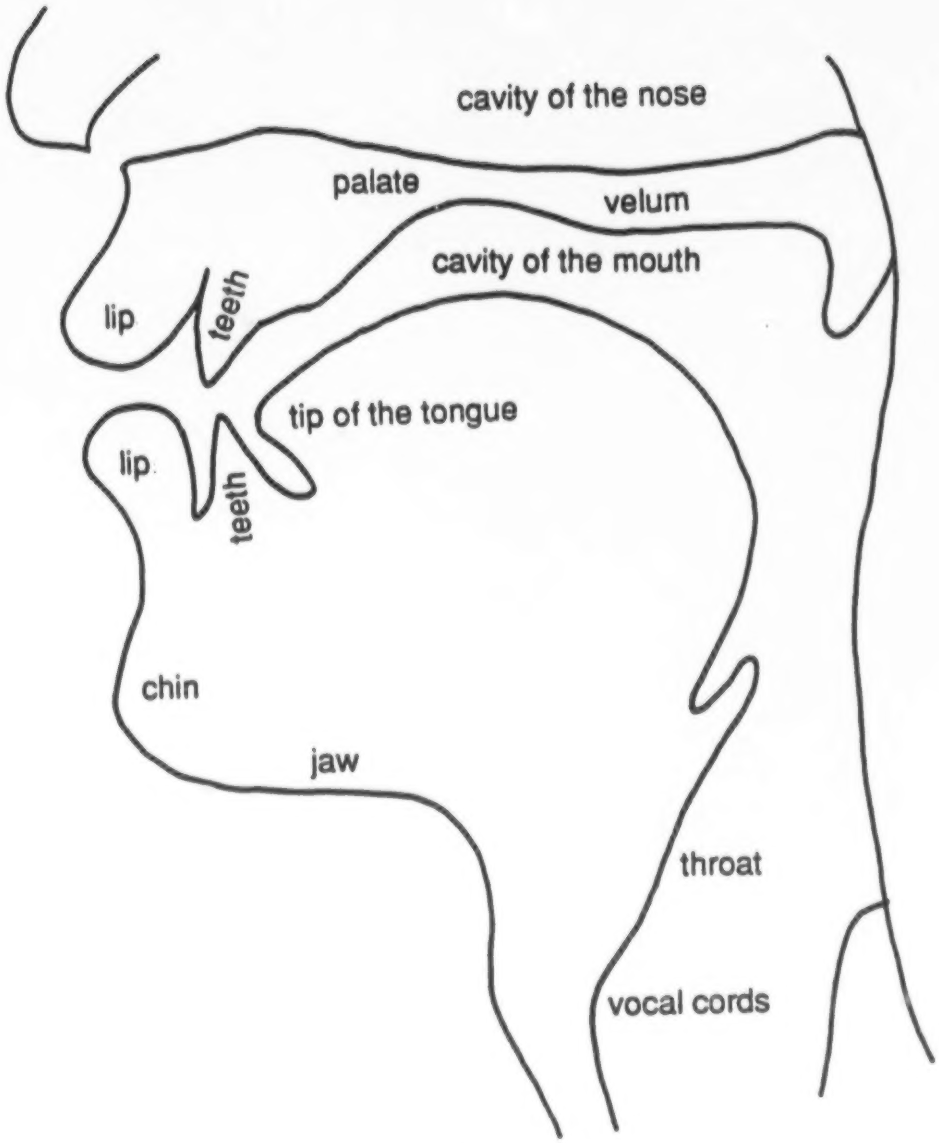
cavity of the nose
palate
velum
cavity of the mouth
lip
teeth
tip of the tongue
lip
teeth
chin
jaw
throat
vocal cords

Fig. 10.

6 PREVOCATIONAL AND VOCATIONAL TRAINING

6.1 Prevocational training in schools

Traditionally many school programmes focus on teaching the children academic skills. This is of course very important since skills in reading, writing, arithmetic, etc., are indispensable in any person's life. But as deaf people's communication handicap generally limits their choice of occupation to jobs which do not depend mainly on spoken language skills, it is also important to give deaf children opportunities to learn how to cope with practical work like gardening, cooking, cleaning, and handicrafts.

This can be done by establishing workshops where the children can work both as part of the curriculum and in leisure hours. The workshops can cover subjects like woodwork, metal-work, leather-work, basketry, pottery, cooking, needlework, photography, gardening, art, sports of various kinds, drama and mime, games like chess, cards, and draughts - according to the possibilities of the school and the culture of the country and the area in which the school is situated.

It can be recommended that the school invite local people to join the workshops as part-time instructors in their crafts, and it is especially advisable to encourage deaf craftsmen to work with the children in the workshops.

When teaching manual work, it is important to include practical and effective management, for example:

a. how to produce more than you need yourself in order to get money for new raw materials, tools, and other commodities by selling your surplus,
b. how and where to buy raw materials, tools, etc.,
c. where to sell the products and to whom,
d. how to keep account.

In prevocational training it is important to give each child an opportunity to try as many different kinds of activities as possible in order to help reveal the child's strongest aptitudes and interests and to encourage him to develop these in adulthood.

6.2 Vocational training and guidance in special institutions

Generally deaf adults can lead perfectly normal lives with family, work, and leisure-time activities. Evidently the deaf adult's inability to hear and communicate freely with other people limits his choice of profession, but in countries with a long tradition for education of deaf children and vocational training, it appears that the employment rate among the deaf population is as high as among the hearing population. In such countries we find deaf people in jobs as draughtsmen, printers, clerks, technicians, teachers of the deaf, preschool teachers, social workers, carpenters, garment workers, cooks, managers, etc.

However, most deaf adults have difficulties in finding their job opportunities and problems communicating with the employer when applying for a job. To reduce these problems, the authorities should establish institutions of vocational guidance and vocational training for deaf people with as varied opportunities of job training as possible.

If deaf people receive vocational training in institutions for handicapped people in general, the professionals working here should be made aware of the specific communication problems of deaf individuals, and they should be offered training in sign language, or an interpreter should be employed to interpret instructions and theoretical subjects. Moreover, as many deaf people as possible should be gathered in the same institutions so that they may benefit from each other's company.

6.3 Vocational guidance in schools for the deaf

If there are no institutions of vocational training and guidance in a country or area, it is to be recommended that the schools for the deaf take up this important task. A teacher or a social worker at the school should be trained to help deaf young people find a satisfactory job.

Her first task is to find employers and companies in the area who are willing to take in deaf young people and give them proper vocational training. Many employers are afraid to employ deaf people, but this emotion is generally based on prejudice towards handicapped people as such. The teacher should, therefore, explain how deafness limits the deaf individual's spoken language skills, but does not influence his abilities to live and work normally.

She should also evaluate every young individual's skills and discuss his interests and abilities with him in order to find the best matches between job opportunities and young people looking for a job. In this evaluation she may draw on reports from the young people's teachers and the instructors of the workshops. Moreover, she should tell the young people of their rights and duties as employees.

When the teacher has found a job for a deaf young individual, she should instruct his employer and future fellow workers how to overcome the communication barrier caused by the deafness. She should tell them:

a. to demonstrate what has to be done instead of just explaining it in spoken language,
b. to point at the things, places, and people that they are talking about,
c. to turn their face directly towards the deaf person while communicating with him.

It is a common experience that employers who have a deaf employee, report that 'He is a very satisfactory and stable worker' and 'He is very reliable and skilled'.

7 AUDIOLOGY

7.1 Sound level and hearing loss

In everyday speech we talk about soft and loud sounds. In audiology we must be more specific. Sound levels are measured in decibels (dB), which is a relative unit. Zero dB does not mean 'no sound at all', but is the level that a normal ear can just perceive. The levels of various everyday sounds are shown below.

dB	SPL (Sound Pressure Level)
130	threshold of pain
120	
110	
100	an automobile horn when you are next to it
90	
80	noise of a motor bus when you are inside it
70	
60	conversational speech
50	
40	
30	
20	
10	
0	threshold of normally hearing adults

7.2 The auditory system

The auditory system can roughly be divided into two main parts, the conductive part and the perceptive part. The conductive part consists of the external ear and the middle ear, while the perceptive part consists of the inner ear (the cochlea) and the sensory pathway (the acoustic nerve).

Hearing loss is also measured in decibels, called dB, HL. A hearing loss at 50 dB, HL, for instance, means that the sound level must be 50 dB before any sound is perceived.

According to *International Classification of Impairments, Disabilities, and Handicaps: A manual of classification relating to the consequences of disease* (Geneva, WHO 1980), we may distinguish between the following levels of hearing impairment:

Total hearing loss	
Profound hearing impairment	more than 91 dB
Severe hearing impairment	70-91 dB
Moderately severe hearing impairment	56-70 dB
Moderate hearing impairment	41-55 dB
Mild hearing impairment	26-40 dB

7.2.1 The external ear

The function of the external ear is mainly to protect the middle ear from damage. An occlusion of the ear canal, for instance by ear wax or dirt, only causes a mild hearing loss, and does not affect the development of speech. If no outer ear canal is developed due to malformation, a moderately severe hearing impairment is present.

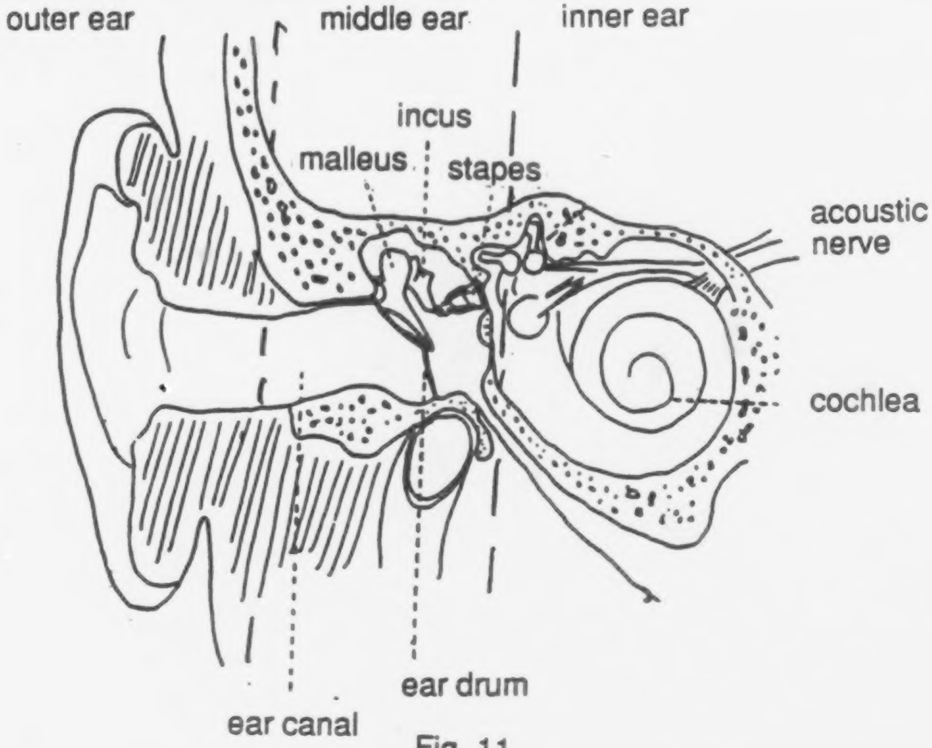
outer ear
middle ear
inner ear
incus
malleus
stapes
acoustic nerve
cochlea
ear drum
ear canal

Fig. 11.

7.2.2 The middle ear

The function of the middle ear is to transfer sound, i.e. vibrations, into the inner ear. A very common cause of hearing disorder can be ascribed to secretory otitis media with middle ear effusion (infection of the middle ear). Especially young children may suffer from this ear disease, and if it persists and turns into a chronic condition, the hearing loss can be 40-60 dB, HL. Such a hearing loss may affect the development of speech and language.

7.2.3 The inner ear and the sensory pathway

When the hearing loss is above 60 dB, HL, the inner ear (cochlea) and/or the sensory pathway (acoustic nerve) must be damaged or malfunctioning. This is called perceptive hearing impairment in contrast to hearing impairment of the conductive part of the ear.

Normally, it is not possible to correct a perceptive hearing impairment by medical or surgical means. Unlike the case of conductive hearing loss, a person with a perceptive hearing loss does not perceive sound normally, even if it is amplified to a level above the hearing threshold. This means that such a person can only benefit from a hearing aid, if he gets special training in understanding speech.

7.3 Medical treatment

Many children may have infections in their ears, and it is very important that they get medical treatment before they are provided with hearing aids. Medical treatment for inflammations in the ear may mean that the child will regain most of his hearing.

In many countries with scattered populations there are vast distances to hospitals and other health-care facilities, and parents may not have opportunities of getting to such facilities with their child. It is, therefore, of importance that the health-care workers who visit these areas also know how to detect and handle problems of hearing losses. The health-care workers should receive basic training in how to identify a hearing loss in small children. Furthermore they should be in close cooperation with the specialized institutions working with hearing impairment, such as hearing clinics, hospital units for treatment of diseases in the ear, early intervention programmes or schools for the deaf.

7.4 Early detection

Normally a child's hearing impairment is realized, because the child develops little or no speech, and only responds to very loud noises or does not respond at all.

Another sign of deafness may be that the child more or less stops babbling at the age of 6 months or makes strange sounds.

In order to start treatment and training of the child as early as possible, it is important to make sure if there is a hearing loss. Identification of a hearing loss is best done in an audiological clinic by trained staff. If this is not possible in a specific area, simple tests can be used in which the child's hearing ability is tested using sound instruments and sounds produced with everyday objects. Such tests for early detection have been developed in the United Kingdom (the Ewing test) and in Sweden (the Boel test). In the absence of more sophisticated technical equipment (e.g. portable audiometers) such tests are helpful in diagnosing the deafness.

7.4.1 The Boel test

The Boel test can be given by the health-care visitor, when the child is 7-10 months old. Through the test one can obtain an idea of the child's attention and reaction to certain sound impressions. It should only be given at a time when the child is healthy, fit, and willing to cooperate.

Instructions:

1. Place the child on the mother's lap and place yourself in a sitting position in front of the mother.
2. Show a coloured stick or a small toy to the child and move it from side to side and up and down.
3. Give the stick or the toy to the child, and when he is occupied playing with it, place your hand discretely behind one of his ears and make sounds with a small bell. Make sure that the child cannot see your fingers move.

4. If the child hears the bell, he will turn his face towards the sound.
5. Repeat the test with three other sound making instruments alternating between the child's ears.
6. Between two sound producing tests, test whether the child is attracted by the movements of your hand rather than by the sound, by moving an object that does not make a sound behind the child's ear.
7. Keep your eyes on the child's face all through the test, so that he will not be distracted by other visual clues.
8. Make sure that the child is occupied with the stick or the toy in his hand all through the testing period.
9 Repeat the test a couple of times at an interval of at least one week.

The Boel test can tell whether the child's reactions are those of a normally hearing child. If he reacts differently, he may have a hearing loss, and a more thorough examination should be provided, if possible by means of an audiometer.

Nurses and health-care workers should be encouraged to make the Boel test part of routine examinations of infants.

When a hearing impairment is discovered, it is of importance to establish the degree of the hearing loss and to diagnose in which part of the ear the disorder is to be found, in order to find out whether medical or surgical treatment is possible.

Confirmation of diagnosis and precise evaluation necessitate audiometers allowing for standard and free-field audiometory and impedance testing.

7.5 Individual hearing aids

The most important technical aid is the individually fitted hearing aid. There are two main types of hearing aids - body-worn aids and ear-level aids. The body-worn aid is the most robust and the easiest to handle. The batteries for this type are the same as for transistor radios, which means that they can often be purchased locally. Body-worn aids should, therefore, be preferred when you give hearing aids to children in areas where there are few possibilities of regular technical adjustment.

If the child has a permanent conductive hearing loss, the hearing aid may give almost normal hearing. However, if the child has a perceptive hearing loss, he will never be able to hear normally even by means of the strongest and best adjusted hearing aid.

Before a child is provided with a hearing aid, several questions should be considered:

1. The parents and the child should have regular and satisfactory counselling and training in the use of a hearing aid and thereby obtain realistic expectations of the use and benefit of a hearing aid.
2. Maintenance of the hearing aid should be made possible. A defective hearing aid may harm the child's development. The batteries and the effectiveness of the hearing aid should be checked every day. If the possibilities of continually checking the hearing aid are not considered, the hearing aid may become a negative factor in the deaf child's development causing frustration in the child as well as in his parents.
3. The adjustment of ear moulds is of utmost importance. When the child is still growing, new ear moulds are needed regularly. If the ear moulds are too small, the hearing aid is worthless, because acoustic feed-back makes it howl. If they are two big, they cause pain.

7.6 Technical equipment in schools

In recent years various types of equipment have been developed for education of deaf children, first of all to facilitate the acquisition of spoken language. The most important piece of technical equipment is the well-adapted and well-maintained hearing aid. The most important additional equipment to the hearing aids is the loop-amplifier, by which the teacher's voice is transmitted by radio to the hearing aids. The advantage of the loop-amplifier is that it is fairly cheap, it is easy to operate, and it is rather durable. The disadvantage is that you cannot use two loop-amplifiers in adjacent rooms at the same time. More sophisticated equipment using radio waves or infra-red light as medium of transmission is not to be recommended, as it is costly and less durable.

For individual speech training and auditory training, an auditory training amplifier can be used. It functions very much like a hearing aid, but the sound quality is better, and there are possibilities of adjusting frequency response, loudness, etc.

If the pupils are not equipped with individual hearing aids, a group hearing aid can be used. It consists of a central amplifier connected to microphones and headsets for each pupil and the teacher. The disadvantage is that the children cannot move about freely, and that they will only receive auditory input when actually in teaching situations and not at leisure time.

If the school is not supplied with electricity, only hearing aids can be used. In order to make the best use of hearing aids, the acoustic properties of the classrooms must be satisfactory. The noise level should not be too high. Noise may originate from adjacent classrooms, from the school playground, cars, birds, rain on a tin roof, etc. Also the reverberation (echo) of the room must not be too strong. If these conditions are not satisfactory, the hearing aids will not function optimally, and maybe the noises perceived through the hearing aids will even disturb the children more than they will help them in the learning process.

If the requirements for handling technical equipment are satisfactory, the following basic equipment is recommended:

1. Individual hearing aids with individually made ear moulds for each pupil.
2. A loop-amplifier.
3. An auditory training amplifier.

Before hearing aids and other equipment are purchased, it must be ensured that qualified staff is available for their utilization and maintenance. This staff should also be called upon for training teachers in the use of the equipment.

It must be strongly emphasized that *technical equipment is only an aid*, and that lack of technical equipment must never delay education of deaf children.

8 SUGGESTED READINGS

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